L 4355-66

ACC NR: AP5028794

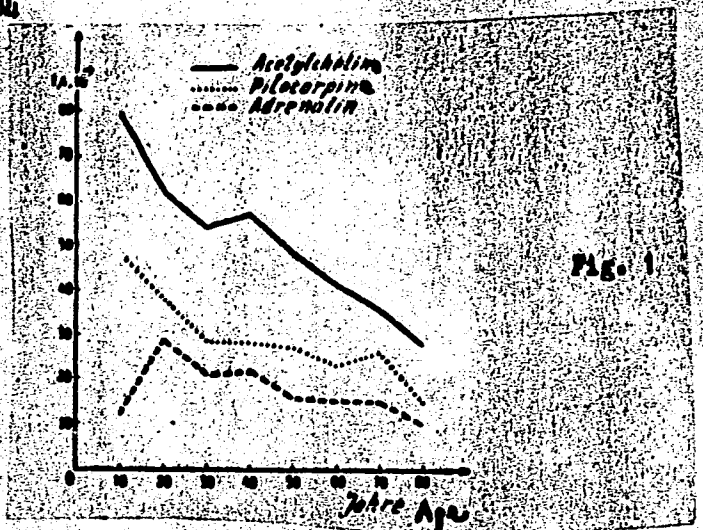


Fig. 1

The work was presented by P. Nikolov, Corresponding Member of BAN, 16 Oct 64. Orig. art. has: 2 tables, 1 figure. [JPRS]

SUB CODE: LS / SUBM DATE: 16Oct64 / ORIG REF: 003 / OTH REF: 006

Card 2/2

MARKOV, M.; TOSHEV, Iv.

On postoperative evisceration. Khirurgiia (Sofiia) 18 no.4: 459-465 '65

1. Okruzhen onkologichen dispanser, Varna (gl. lekar M. Markov).

DASKALOV, D.; MARKOV,M.; MINEV, Ts.

Neurovegetative reaction in women and men. Izv biol med BAN 3 no.4: 91-97 '60. (EEAI 10:3)

1. Institut po fiziologiia pri BAN (Direktor: akad. D.Orakhovets)
(NERVOUS SYSTEM)

MARKOV, M.

Changes in the electroconductivity of skin in contact with anod. Doklady BAN 14 no.4:413-415 '61.

1. Physiologisches Institut an der Bulgarischen Akademie der Wissenschaften. Vorgelegt von Akademiemitglied D. Orahovats [D. Orakhovats].

MARKOV, M.

Relative dependency of electroconductivity from number of active perspiratory glands after electrophoresis of acetylcholin adrenalin and pilocarpin. Doklady BAN 14 no.5:555-558 '61.

1. Physiologischches Institut der Bulgarischen Akademie der Wissen - schaften. Vorgelegt von Akademiemitglied D. Orachovats[D. Orakhovats]

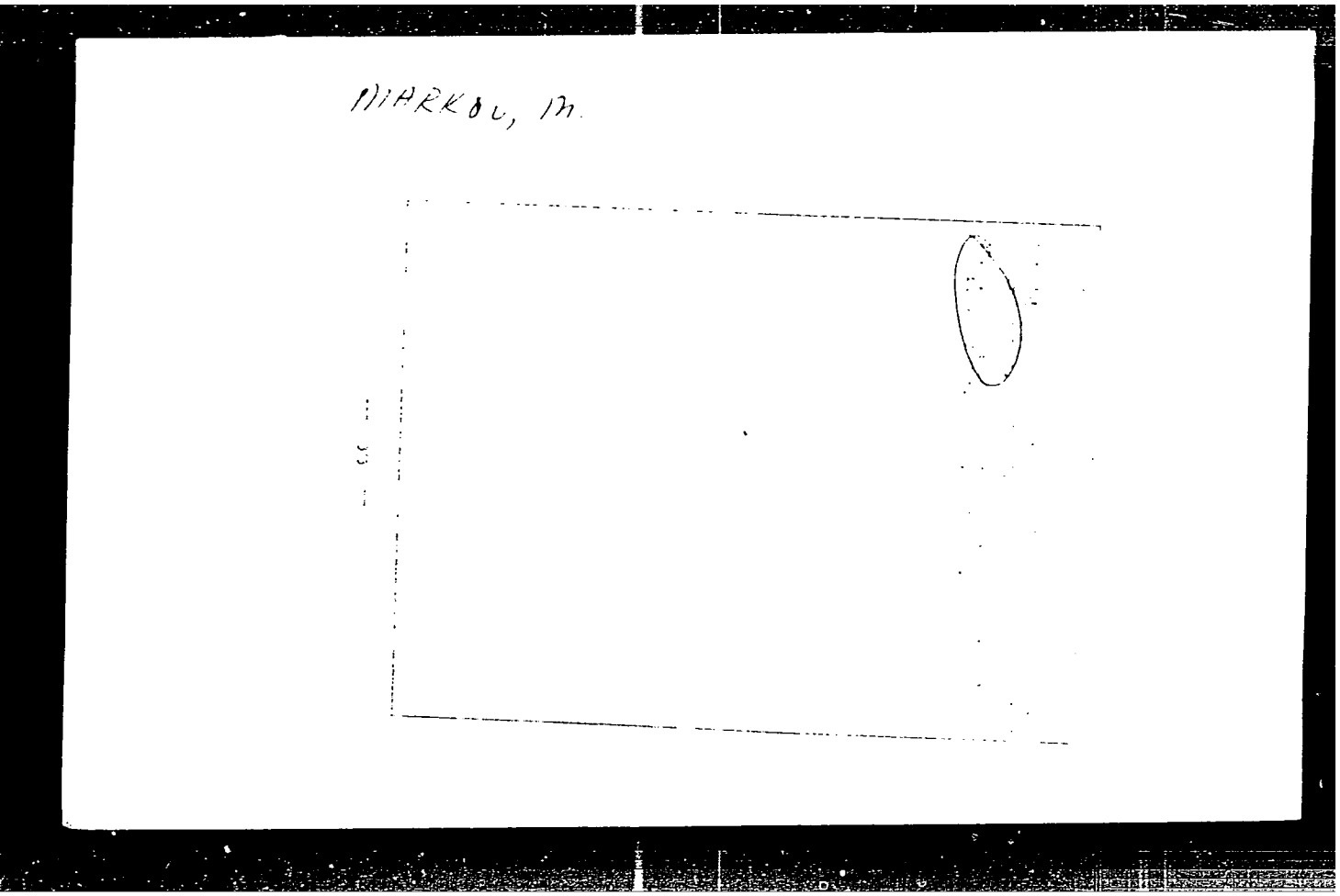
(Electric conductivity) (Cataphoresis)
(Adrenalin)

MARKOV, M.; PETROV, I.

Investigation of perspiration suggested during hypnotic condition.
Doklady BAN 14 no.7:771-774 '61.

1. Vorgelegt von Akademiemitglied D. Orahovats [D. Orakhovats].

(PERSPIRATION) (HYPNOTISM)



MARKOV, M.; PETROV, I.

On the mechanism of gustatory sweating. Dokl. Bolg. akad. nauk 15 no.1:89-92 '62.

1. Vorgelegt von Akademiemitglied D. Orahovats.
(SWEATING physiol) (TASTE physiol)

GRAHOVATS, D.; MARKOV, M.; WARBANOV, W.

Effect of the resistance of the soft tissue of the extremities in measuring blood pressure with Korotkoff's method. Dokl. Bolg. akad. nauk 15 no.3:333-336 '62.

(BLOOD PRESSURE) (LEG blood supply)

MARKOV, M.

Changes in the electrical conductivity and potential of the skin in pressure on the anode in relation to the initial degree of electrical conductivity and potential differences. Izv. inst. fiziol. 5:179-186 '62.

(SKIN physiol)

MARKOV M

(9)

21. "On Nuclear Polyhedrosis in the Satin Moth (Stilpnotia Salicis L.)," R. GRI[illegible]; article in English; pp [illegible]-85.

22. "On the Mechanics of Gustatory Sweating," [illegible] MARKOV and I. PETROV; article in German; pp 89-92.

23. "On the Nature of the Incomplete Valves in the External Iliac and Femoral Vein," V. VANKOV; article in English; pp 93-96.

24. "Volutine and the Nuclear Masses of Micro-organisms under the Influence of Penicillin and Sulfathiazole," G. KHRISTOV; article in French; pp 97-100.

25. "Experimental Investigations into the Pharmacological Effect of Several Preparations from the Drug Sempervivum Tectorum," [illegible], Ts. [illegible], and P. MANOLOV of the Institute for Experimental [illegible] Therapy; article in German; pp [illegible]-103.

ORAHOVATS, D. [Orakhovats, D.], akad.; MARKOV, M.; WARBANOV, W. [Vurbanov, V.]

Effect of the resistance of soft tissues in the measurement of blood pressure by the Korotkov method. Doklady BAN 15 no.3:333-336 '62.

1. Physiologisches Institut der Bulgarischen Akademie der Wissenschaften. 2. Chlen Redaktsionnoy kollegii, "Doklady Bolgarskoy Akademii Nauk" (for Orakhovats).

*

ORAKHOVATS, D. [deceased]; DRAGANOV, I.; V[illegible]AN V, V.; [illegible]KOV, M.; [illegible]V, A.; PAM[illegible]OV, V.; NA[illegible]EV, Ch.

Simultaneous recording of the arterial pressure, sc[illegible], Korotkov's tones and pressure of the cuff of the brac[illegible] artery by means of direct measurement in man. Izv. Inst. Fiziol. [illegible] 7:5-18 '64.

ORAKHOVATS, D. [deceased]; MARKOV, M.; V[illegible]ANOV, V.; DRAGANOV, L.

Studies on the development of Korotkov's tones. Izv. Inst. fiz. .. (Sofiia) 7:19-28 '64.

MARKOV, M.

[illegible] of active [illegible] of plants [illegible] concentrations of anthocyanins. Ukr. biokhim. zhur. 13 no.1:133-138 '41. [illegible]

ACC NR: AP7008901 SOURCE CODE: UR/0386/66/003/002/0098/0100

AUTHOR: Markov, M.

ORG: Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR (Fizicheskiy institut AN SSSR)

TITLE: Search for specific mu-meson and sup nu mu-neutrino interactions at very high energies

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu, v. 3, no. 2, 1966, 98-100

TOPIC TAGS: mu meson, meson interaction, neutrino, cosmic ray

SUB CODE: 20

ABSTRACT: New information gathered from cosmic ray studies seems to indicate that at very high energies there may exist specific μ-meson and ν_μ-neutrino interactions in addition to the usual electromagnetic and weak interactions. The author investigates a pseudovector (pseudo-Maxwellian) field with $g(\hbar/mc)\,\gamma_5\,\gamma_\mu\,\gamma_\nu\,(\partial P_\mu/\partial x_\nu)$-type interactions. In the first approximation the g-charge is carried by a μ-meson and nucleons only; a ν_μ-neutrino and electron carry a much weaker g-charge. An evaluation of μ-pair production by pseudophotons in Coulomb fields of extended nuclei is given for $Z = 10$, ($\sigma_{2\mu} \simeq 10^{-27}$–$10^{-28}$ cm^2), and a very general discussion of the existing experimental material is presented. Detailed numerical evaluations must be postponed until more reliable data becomes available. [JPRS: 35,630]

Card 1/1

MARKOV, M.; MINEV, Ts.

Changed number of active seat glands of the forearm in persons of different ages after acetylcholine and adrenaline electrophoresis before and after thermal stimulation. Izv. inst. fiziol. (Sofia) 8:69-76 '64

RUSINOV, K.; MARKOV, M.; B[illegible] - [illegible]RAGANOVA, [illegible] S[illegible]KOVA, [illegible]

Some pharmaco-physi[illegible] [illegible] [illegible] [illegible]
(Sofia) [illegible] -54 [illegible]

MARKOV, M.

Age changes in the electrical conductivity of the skin after the alectrophoretic administration of acetylcholine, adrenaline and pilocarpine. Dokl. Bolg. akad. nauk 18 no.2:183-186 '65

1. Submitted on October 16, 1964

~~5(3)~~ 5.5600

66965

AUTHORS: Kondrat'yev, D. A., Markov, M. A., Minachev, Kh. M. SOV/32-25-11-13/69

TITLE: Analysis of Mixtures of C_5 to C_7 Hydrocarbons by the Method of Liquid - Gas Chromatography

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 11, pp 1301-1304 (USSR)

ABSTRACT: A simple device with a microflame detector (Ref 1) designed for the analysis of paraffin hydrocarbons, naphthenes, aromatic, and some unsaturated C_5 to C_7 hydrocarbons has been developed. The construction of the dosing evaporator and the microflame detector was based on a device developed by B. A. Rudenko (Izvestiya AN SSSR, in the press). The detector is, in principle, a burner consisting of a capillary 1 mm in diameter. The burner is located at the upper output of a column 6 m long, and is connected to a Chromel-Alumel thermocouple (Fig 1: Scheme of the device). Data obtained with the detector are recorded by automatic recording potentiometer of the types PS1-01 or EPP-09, with a second PP potentiometer connected thereto. The hydrocarbons may be analyzed by means of a thermostat of the

Card 1/3

66965

Analysis of Mixtures of C_5 to C_7 Hydrocarbons SOV/32-[illegible]-11-13/63

by the Method of Liquid - Gas Chromatography

type TS-15M[28] at constant or variable temperature. The best separating efficiency was reached when two columns (each 3 m long) were used, the one filled with diatomite brick chips (0.25 to 0.5mm) and tricresyl phosphate, and the other filled with diatomite brick chips and dioctyl phthalate. Separation was first effected at 15 - 20°C (for 15 minutes), and all normal and isoparaffin hydrocarbons C_5 to C_7 were separated from one another, whereafter temperature was raised to 85°C (1.5° per minute). Hydrogen was passed through the system with a rate of 60 cm^3 per minute. The chromatogram of a 15-component (C_5 to C_7 hydrocarbon) mixture shows that all substances could be separated except for the pairs 2,3-dimethylbutane - 2-methylpentane, cyclopentane - 3-methylpentane, and cyclohexane - 3-methylhexane. Results of an analysis of an artificial hydrocarbon mixture (Table 1) as well as with catalyzates at elevated temperature and hydrogen pressure (Table 2) are given. There are 3 figures, 2 tables, and 2 Soviet references.

Card 2/3

66965

Analysis of Mixtures of C_5 to C_7 Hydrocarbons by the Method of Liquid - Gas Chromatography

SOV/32-25-11-13/69

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N.D.Zelinskiy of the Academy of Sciences of the USSR)

Card 3/3

MINACHEV, Kh.M.; SHUYKIN, N.I.; MARKOV, M.A.

Effect of the specific surface of a platinized aluminosilicate on the degree of n-nonane conversion. Report No.1: Change in the activity of platinized aluminosilicate in the course of the treatment of the carrier with hydrogen. Izv.AN SSSR Otd.khim. nauk no.5:907-912 My '60. (MIRA 13:6)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo Akademii nauk SSSR.
(Aluminosilicates) (Platinum) (Nonane)

S/062/60/000/008/023/033/XX
B013/B055

AUTHORS: Minachev Kh. M., Shuykin, N. I., and Markov, M. A.

TITLE: Investigation of the Effect of the Specific Surface of Platinized Alumosilicate on the Degree of n-Nonane Conversion

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk. 1960. No. 8. pp. 1466-1470

TEXT: This paper is a continuation of the studies on the effect of the specific surface of catalysts on the degree of hydrocarbon conversion. For this purpose, the authors studied the conversion of n-nonane on alumosilicate catalysts with widely varying specific surfaces. Two 0.5% platinum/alumosilicate catalysts with specific surfaces of 320 m^2/g (K-1) and 60 m^2/g (K-2) were used. A standard alumosilicate catalyst for the cracking process was used as carrier for the preparation of the platinum catalysts. To prepare the latter, the carrier was saturated with a dilute H_2PtCl_6 solution. The data of the n-nonane used were in agreement with those given in Ref. 4. Infrared spectra showed the n-nonane to be free

Investigation of the Effect of the Specific Surface of Platinized Alumosilicate on the Degree of n-Nonane Conversion

S/062/60/000/008/023/033/XX
B013/B055

of isomers. The experimental apparatus has been described in Ref. 1. The experiments were carried out in a continuous system at 360 to 450°C, a hydrogen pressure of 10 atm and a flow rate of 1 h^{-1}. The molar ratio of hydrocarbon and hydrogen was 1:5. A fresh catalyst was used for each experiment. The results of the examination of the catalyzates are listed in Tables 1 and 2 and graphically represented in Figs. 1 - 3. These data show that the degree of hydrocracking of hydrocarbons considerably decreases with decreasing specific catalyst surface. This is in agreement with data given in Ref. 2. The yields of hydrocracking products on K-1 catalysts were found to increase more rapidly with a temperature rise than on K-2 catalysts. At temperatures of 420° - 450°C, hydrocracking on K-2 is insignificant, which enables C_9 isoalkanes to be obtained in comparatively high yields (54% at 450°C). On K-1, the maximum yield of isononanes is obtained at 380°C (53%). Since aromatization occurs to a noticeable degree only at 400°C, aromatic hydrocarbons can be obtained over K-2 before C_9 isoalkane yields are reduced. The total yield of hydrocracking products under the experimental conditions was 45.7% over K-1, and 25.3% over K-2. The experiments have thus shown that by decreasing the specific surface

Card 2/3

Investigation of the Effect of the Specific Surface of Platinized Alumosilicate on the Degree of n-Nonane Conversion

S/062/60/000/008/023/033/XX
B013/B055

of the catalyst the process can be carried out at higher temperatures without the occurrence of hydrocracking. There are 3 figures, 2 tables, and 4 Soviet references.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR
(Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences USSR)

SUBMITTED: February 18, 1959

Card 3/3

5.3[illegible]

[illegible]

AUTHORS: Tits-Skvortsova, I. N., Danilova, T. A., Markov, M. A., Stepanova, I. I., Osipenko, Ts. D.

TITLE: Synthesis and Conversions of Sulfur Compounds of Naphthalene Series Over an Alumina-Silica Catalyst

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 3, pp 985-991 (USSR)

ABSTRACT: The following compounds were synthesized and their conversions over an alumina-silica catalyst at 300° was studied. α - Thionaphtnol (72%), bp 143-144° (6 mm); β-thionaphtnol (80%), mp 79-80°; α -napthyl decyl sulfide (72%); α -naphthyl cyclopentyl sulfide (45.6%), bp 168-168.5° (2 mm), n_D^{20} 1.6419, d_4^{20} 1.1193;

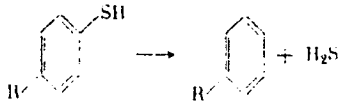
β-naphthyl decyl sulfide (68%), bp 209-219° (2.5 mm), mp 34-35°; β-naphthyl cyclopentyl sulfide (65%), bp 187.5-188° (4 mm), n_D^{20} 1.6455, d_4^{20} 1.1052. This

Card 1/5

Synthesis and Conversions of Sulfur Compounds of Naphthalene Series Over an Alumina-Silica Catalyst

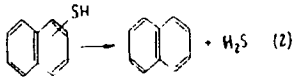
78297
SOV/79-30-3-51/69

study was undertaken to see whether the conversions of the thionaphthols over the above catalyst at 300° proceed similarly to the conversions of aromatic thiols under the same conditions. Conversions of aromatic thiols proceed as authors showed (DAN SSSR, 80, 377, 1951; ZhOKh, 21, 212, (1951); and others), according to the following scheme:



(1)

It was found that both α- and β-thionaphthols undergo an identical conversion over this catalyst at 300°, according to the following scheme:

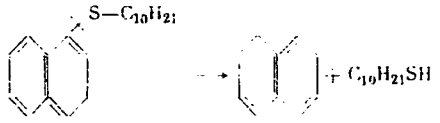


(2)

Card 2/5

Synthesis and Conversions of Sulfur Compounds of Naphthalene Series Over an Alumina-Silica Catalyst

Comparison of schemes 1 and 2 shows that the isomeric α- and β-thionaphthols and aromatic thiols undergo similar conversions over the same catalyst at the same temperature. α-Naphthyl decyl sulfide decomposes over the catalyst at 300° to form naphthalene (36%, of weight of catalyst), decyl mercaptan (13.1%), decene (7.8%), and H_2S, according to scheme:

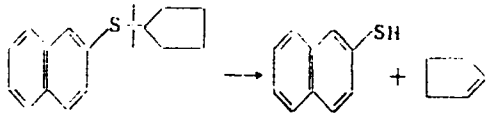


(3)

α-Naphthyl cyclopentyl sulfide decomposes over the catalyst to form naphthalene (40% of weight of catalyst), cyclopentanthiol (6.6%), dicyclopentyl sulfide (2.2%) and H_2S. The reaction proceeds also analogously to scheme 3. Catalytic decomposition of β-naphthyl cyclopentyl sulfide under above conditions results in the formation of β-thionaphthol (15.6% of weight of catalyst), cyclopentene (10.2%),

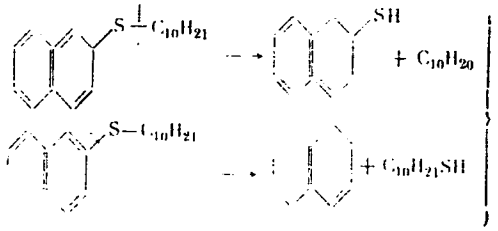
Card 3/5

naphthalene (43.5%) and H_2S, according to a different scheme:



(4)

Catalytic decomposition of β-naphthyl deriv[illegible] under the same conditions results in the formation of: β-thionaphthol (1.1% of weight of catalyst), decyl mercaptan (6%), naphthalene (30.5%), decene-1 base fraction (4.2%) and H_2S, according to:



(5)

Card 4/5

Synthesis and Conversions of Sulfur Compounds of Naphthalene Series Over an Alumina-Silica Catalyst

7827
SOV/79-30-3-51/69

The comparative strength of the sulfur bond with different radicals is shown in scheme 6:

$$C_6H_5-S\frac{1}{1}C_{10}H_{21} \qquad C_{10}H_{21}-S\frac{1}{1}C_6H_{11}$$

$$C_6H_5-S\frac{1}{1}C_5H_9 \qquad \beta\text{-}C_{10}H_7-S\frac{1}{1}C_5H_9$$

$$C_6H_5-S\frac{1}{1}C_6H_{11} \qquad C_{10}H_{21}-S\frac{1}{1}\alpha\text{-}C_{10}H_7$$

$$C_{10}H_{21}-S\frac{1}{1}C_5H_9 \qquad C_5H_9-S\frac{1}{1}\alpha\text{-}C_{10}H_7 \qquad (6)$$

There are 3 tables; and 14 references, 1 U.S., 1 Dutch, 4 German, 8 Soviet. The U.S. reference is: E. D. Rossini and others, Selected Physical Values and Thermodynamic Properties of Hydrocarbons and Related Compounds (1953).

ASSOCIATION: Moscow State University (Moskovskiy gosudarstvennyy universitet)

SUBMITTED: March 5, 1959

Card 5/5

MINACHEV, Kh.M.; MARKOV, M.A.; LOGINOV, G.A.

Conversions of five- and six-membered cyclenes on rare-earth oxides. Neftekhimiia 1 no.3:356-361 My-Je '61. (MIRA 16:11)

1. Institut organicheskoy khimii AN SSSR imeni N.D. Zelinskogo.

5.1190

31746
S/204/61/001/004/003/005
E075/E185

AUTHORS: Minachev, Kh.M., Markov, M.A., and Shchukina O.K.

TITLE: Dehydrogenation of cyclohexane on the oxides of rare earth elements

PERIODICAL: Neftekhimiya, v.1, no.4, 1961, 489-493

TEXT: Eight oxides of rare earth elements and yttrium oxide were used as catalysts for the dehydrogenation of cyclohexane. The catalysts were prepared by dissolving the commercial oxides in 27% nitric acid, and precipitating with 12% ammonia solution at 50-60 °C. The dried and washed precipitates were compressed into 4 x 4 mm cylinders and heated at 560 °C in dry air for 8 hours. The surface areas of the oxides so obtained were determined by benzene vapour adsorption. The dehydrogenations were carried out at 515-590 °C under atmospheric pressure. The catalysts were activated at 560 °C for 2 hours by passing through them currents of air, hydrogen or nitrogen. The catalysts with the greatest activity were produced by the activation with nitrogen. Experimental results show that all the catalysts dehydrogenate cyclohexane to benzene

Card 1/4

Dehydrogenation of cyclohexane ...

The determination of specific areas of the catalysts permitted the calculation of the specific activity and specific coke formation for the various catalysts, and thus their relative overall activities could be compared. The results are given in Table 4. It can be seen that the specific activity and coke formation at 530-560 °C does not differ much inside the yttrium group of the oxides. The yttrium group oxides exceed the cerium oxide group in respect of activity. It was shown that there exists linear dependence between the logarithms of the percentage conversion and the reciprocal temperature of the reaction. The energies of activation calculated from the slopes of the lines had typical values for acidic catalysts in the case of neodymium, gadolinium and holmium oxides, but exceeded 50 kcal for the remaining oxides. There are 4 figures, 4 tables and 8 references: 5 Soviet-bloc and 3 non-Soviet-bloc. The English language references read:

Ref. 1: R.A Briggs, H.S. Taylor,
J. Amer. Chem. Soc., v.63, 2500, 1941.
Ref. 4: V.I. Komarevsky, Ind. Eng. Chem., v 49 264 1957.

Card 2/4 5

31746
S/204/61/001/004/003/005
E075/E185

Dehydrogenation of cyclohexane ...

ASSOCIATION: Institut organicheskoy khimii AN SSSR im. N.D. Zelinskogo
(Institute of Organic Chemistry, AS USSR, imeni N.D. Zelinskiy)

SUBMITTED: June 7, 1961

X

Card 3/4

MINACHEV, Kh.M.; MARKOV, M.A.; SHCHUKINA, O.K.

Dehdrocyclization of n-heptane over rare earth oxides. Neftekhimiia 1 no.5:610-612 S-O '61. (MIRA 15:2)

1. Institut organicheskoy khimii AN SSSR imeni N.D.Zelinskogo.
(Heptane)(Aromatization)(Rare earth oxides)

S/081/62/000/009/038/075
B158/B101

AUTHORS: Tits-Skvortsova, I. N., Danilova, T. A., Larkov, ... A., Stepanova, L. I., Osipenko, Ts. D.

TITLE: Conversion of organosulfur compounds of the α- and β-naphthalene series in the presence of an aluminosilicate catalyst

PERIODICAL: Referativny zhurnal. Khimiya, no. 9, 1962, 298, abstract 9Zh156 (Sb. "Khimiya seraorgan. soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh. v. 4", L., Gostoptekhizdat, 1961, 141 - 144)

TEXT: Contact conversions of organosulfur compounds of naphthalene as carried out at 300°C on an aluminosilicate catalyst under conditions described earlier (Zh. obshch. khimiya, v. 21, 1951, 242) are reexamined. α- and β-thionaphthols (α- and β-I) were synthesized for research, α- and β-naphthyldecylsulfides (α- and β-II) and α- and β-naphthylcyclopentylsulfides (α- and β-III) synthesized for the first time. It was found that under these conditions α-I and β-I are converted to $C_{10}H_8$ and H_2S similarly to the thiophenols studied earlier the respective yields being 52 and 43%

Card 1/2

by weight of catalyst. As established previously (see UCh, zap. LGU, v.111, 1953, 263), in the case of mixed sulfides of the C_6H_5SR type (R being an alkyl or cycloalkyl), the bond between the sulfur and R is always ruptured. In the case of [illegible]-II, it was found that $C_{10}H_8$ and $C_{10}H_{21}SH$ are formed with further conversion of the latter to $C_{10}H_{20}$ and H_2S. [illegible]-III also decomposes in the same way, forming $C_{10}H_8$ and cyclopentanethiol with subsequent conversion of the latter to dicyclopentylsulfide and H_2S. [illegible]-III under these conditions decomposes to [illegible]-I, cyclopentane, $C_{10}H_8$ and H_2S. In the case of [illegible]-II, -I, $C_{10}H_{21}SH$, a decene-decane fraction and H_2S were detected. Consequently the bond between the sulfur and the benzene ring in mixed sulfides is much more stable and was not ruptured in any of the cases examined. The bond between the sulfur and the $C_{10}H_8$ in the [illegible]-position is far less stable. The bond between the sulfur and the alkyl and naphthyl in the [illegible]-position is more stable than that between the sulfur and naphthene rings. [Abstracter's note: Complete translation.]

Card 2/2

MINACHEV, Kh.M.; MARKOV, M.A.; KHODAKOV, Yu.S.

Effect of gamma rays on the catalytic activity of platinized aluminosilicate. Izv. AN SSSR. Otd.khim.nauk no.7:1227-1230 Jl '61. (MIRA 14:7)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.
(Aluminosilicates) (Catalysis) (Gamma rays)

S/[illegible]
B[illegible]

AUTHORS: Minachev, Kh. M., Markov, M. A., and [illegible] K.

TITLE: Investigation of the catalytic [illegible] rare earths

PERIODICAL: Akademiya nauk SSSR. Izvestiya. [illegible] nauk, no. 8, 1961, 1507-[illegible]

TEXT: The authors investigated the [illegible] The and a mixed catalyst from 15 % erbium [illegible] specific surface of the catalysts [illegible] dynamic method by A. M. Rubinshteyn and V. A. A[illegible] AN SSSR. Otd. khim. n., 1955, 1[illegible] 190 m^2/g for Er_2O_3/Al_2O_3. The propert[illegible] listed in Table 1. The experiments were [illegible] temperatures from 545°-590°C and atmospher[illegible] current. The volume rate of the supplied [illegible] 0.25 hr^{-1}. Before each experiment the [illegible] with hydrogen at 550°C. After the experimen[illegible]

Card 1/6

Investigation of the catalytic...

500°-520°C with air, which was diluted with [illegible] of 5-7 %. During the regeneration the [illegible] catalyst was determined. The experiments [illegible] The liquid catalysis products were analyzed [illegible] (Ref. 8: D. A. Kondrat'yev, M. A Markov and K. M [illegible] laboratoriya 25, 1301 (1959)) The [illegible] according to the method by G. P. Kaufman (Ref. 9: [illegible] zhirov, M. - L., 1937). An adsorption [illegible] conductivity detector was used for the analysis [illegible] products. The experiments showed that the [illegible] during the conversion of cyclohexane in E_2 [illegible] %

at a temperature increase from 545° to 590°C [illegible] of gaseous products increases from 14.5 % to [illegible] % from 0.5 % to 1.2 %. During the conversion [illegible] E_2 [illegible]

the yield of liquid catalysates amounted to [illegible] % at 590°C. The yield of gaseous products increased [illegible] % at suitable temperatures. The amount of coke accumulated [illegible] was about equal in both cases. During the conversion [illegible]

Card 2/6

Investigation of the catalytic....

hydrocarbons, the yield of liquid catalysates on pure Er_2O_3 was much higher than on Er_2O_3/Al_2O_3. However, due to the lower stability of n-heptane and ethyl cyclopentane it was not so big as for cyclohexane. Pure Er_2O_3 thus has a much weaker cracking effect than Er_2O_3/Al_2O_3. The analysis of gaseous catalysis products showed that at any rate the gas obtained on Er_2O_3/Al_2O_3 is richer in hydrocarbons than that obtained on Er_2O_3. During the conversion of cyclohexane and n-heptane the amount of saturated and unsaturated hydrocarbon is about equal. In the analysis of ethyl cyclopentane, the gas produced on Er_2O_3/Al_2O_3 contains 14.1 % unsaturated and 10.4 % saturated hydrocarbons. The analysis of the liquid catalysis products showed that the product obtained during the conversion of cyclohexane consists of unchanged hydrocarbon, benzene, methyl cyclopentane and cyclohexane. The benzene content in the product obtained on Er_2O_3/Al_2O_3 amounted to 4.1 % at 545°C and 27.4 % at 590°C. On pure Er_2O_3, the benzene content at 545°C was 1.2 % and at 590°C 17.1 %. The

Card 3/6

S[illegible]
B[illegible] B.

unchanged n-heptane, toluene and benzene was identified [illegible] conversion of n-heptane. The content of aromatic hydrocarbons was about equal in the liquid catalysate in the presence of both catalysts. The yield of liquid catalysate, however, was much higher on pure Er_2O_3 than on Er_2O_3/Al_2O_3. More aromatic hydrocarbons are thus obtained Er_2O_3 per hydrocarbon used than on Er_2O_3. The presence of benzene in the catalysis products of n-heptane points towards the dehydrogenation process. When passing through ethyl cyclopentane, no toluene was established on Er_2O_3. In the product obtained on Er_2O_3/Al_2O_3, however, 8.1% toluene were found. The iodine numbers of the products obtained during the conversion of cyclohexane and n-heptane on both catalysts were usually not higher than 15. The iodine number of the product obtained from cyclohexane on the mixed catalyst at 590°C, i.e. 29, was an exception. During catalysis of ethyl cyclopentane, the iodine numbers of the catalysates were 29 on Er_2O_3 and 52 on Er_2O_3/Al_2O_3. There are [illegible] tables and 10 references: 6 Soviet-bloc and 4 non-Soviet [illegible] The [illegible]

Card 4/6

Investigation of the catalytic...

references to English-language publications read as follows: R. A. Briggs, H. S. Taylor, J. Amer. Chem. Soc. 63, 2500 (1941); V. I. Komarevsky, Industr. and Engng. Chem. 49, 264 (1957); g. E. Green, Nature 180, N 4580, 295 (1957).

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy, AS USSR)

SUBMITTED: December 13, 1960

Card 5/6

27493
S/062/61/000/009/008/014
B117/B101

5 1190 2209, 1274 1273

AUTHORS: Minachev, Kh. M., Markov, M. A., and Shchukina, O. K.

TITLE: Study of the catalytic properties of rare earth oxides 2. Transformation of cyclohexene, 1-methyl cyclohexene-1, and n-heptene-1 on erbium oxide

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 9, 1961, 1665-1669

TEXT: The present work which continues the studies on the catalytic properties of rare earth oxides was undertaken with a view to investigating the behavior of several cycloalkenes on pure erbium oxide and a mixed catalyst (15% erbium oxide, 85% aluminum oxide) at 510°-515°C. Catalyst preparation, reaction conditions and method of analyzing the catalyst have been described previously (Ref. *: Izv. AN SSSR. Otd. khim. n. 1961, no 8). The following hydrocarbons were used: cyclohexene; 1-methyl cyclohexene-1, n-heptene-1; the yields of liquid catalysis products obtained by passing the two first-mentioned cycloalkenes over Er_2O_3 were independent of time and amounted to 80.7% and 83.4%, respectively. They contained no hydr-

Card 1/6

Study of the catalytic properties ...

carbons of molecular weight higher than that of the initial substance. Chromatographic analysis showed that the gas formed simultaneously is made up of 90-96% hydrogen and 4-10% C_1 to C_4 hydrocarbons. Carbonization on Er_2O_3 was insignificant. The product obtained from cyclohexene over Er_2O_3 consisted of benzene (20-23%) and cyclohexene. In experiments using 1-methyl cyclohexene-1 and the same catalyst, 1-methyl cyclohexene-1, a mixture of 1-methyl cyclohexene-2 and 1-methyl cyclohexene-3, and toluene were identified in the reaction product. The results obtained in the conversion of 1-methyl cyclohexene-1 on Er_2O_3 are given in Table 2. The tests with cyclohexene and 1-methyl cyclohexene-1 over Er_2O_3/Al_2O_3 showed that the yield of liquid products increases with time. The gases analyzed consisted of 85%-93% hydrogen and 7-15% C_1 to C_4 hydrocarbons. As in the case of Er_2O_3, the gas was richer in hydrocarbons towards the beginning of the experiments. Carbonization on Er_2O_3/Al_2O_3 was higher than on pure erbium oxide. The composition of the catalyzate obtained from cyclohexene over Er_2O_3/Al_2O_3 is represented in Table 3. The composition of the

Study of the catalytic properties ...

catalyzate obtained from 1-methyl cyclohexene-1 was only partially clarified, since the chromatogram was greatly complicated by the formation of dimethyl cyclopentenes. A sample drawn within the first two hours was found to contain 63% toluene. The total yield of catalysis products in tests with n-heptene-1 over Er_2O_3 was 74.5% and over Er_2O_3/Al_2O_3 68.3%. The gas formed over Er_2O_3/Al_2O_3 contained double the quantity of hydrocarbons that was obtained over Er_2O_3. The liquid catalysis products contained 6% toluene in the case of Er_2O_3 and 8.5% in the case of Er_2O_3/Al_2O_3. The chromatogram of the product obtained over Er_2O_3/Al_2O_3 exhibited six peaks in the C_7 hydrocarbons region, apart from toluene, as compared to two peaks in the case of Er_2O_3. Er_2O_3 catalysis yielded products containing 91.8% unsaturated hydrocarbons and Er_2O_3/Al_2O_3 47.0%. In conclusion, the investigation of these two catalysts yielded the following results: They differ inasmuch as the mixed catalysts produced isomerization of the 6-membered ring to a 5-membered ring, whereas this isomeriza-

Card 3/6

Study of the catalytic properties . .

tion does not occur with pure erbium oxide. Both catalysts dehydrogenate the tested cycloalkenes to corresponding aromatic hydrocarbons and cause shifting of the double bond in the ring. There are 3 figures, 3 tables and 5 references: 3 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: F. G. Rossini, K. S Pitzer, R. L. Arnett, R. M. Braun, G. C. Pimentd, Selected values of physical and thermodynamic properties of hydrocarbons and related compounds, Carnegi Press. 1953; E. Gil-Av, J. Herling, J. Shabtai, Chem and chem. Ind. no. 9, 1483 (1957).

ASSOCIATION: Insitut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D Zelinskiy of the Academy of Sciences USSR)

SUBMITTED: December 13, 1960

Card 4/6

LUKINA, M.Yu.; ZOTOVA, S.V.; MARKOV, M.A.; OVODOVA, V.A.; KAZANSKIY, B.A., akademik

Transformations of isopropenylcyclopropane in the presence of kieselguhr. Dokl. AN SSSR 139 no.2:381-384 Jl '61. (MIRA 14:7)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.
(Propene) (Kieselguhr)

S/204/62/002/002/001/007
I060/I242

AUTHORS: Minachev, Kh.M., Markov, M.A., and Bogomolov, V.I.

TITLE: Conversion of cyclohexane and n alkanes on rare earth oxides

PERIODICAL: Neftekhimiya, v.2, no.2, 1962, 144-149

TEXT: This work is a continuation of the investigation of the catalytic effect of oxides of rare earth elements on dehydrogenation and dehydrocyclization of hydrocarbons. Neodymium, holmium, and yttrium oxides on activated carbon have shown a high activity in the dehydrogenation of cyclohexane and in dehydrocyclization of n alkanes. When the concentration of Nd_2O_3 in the catalyst increases from 0.5 to 5%, the output of benzene from cyclohexane at 500° grows from 19.6 to 49.4%, while higher concentrations of oxide up to 15% do not produce

Card 1/2

S/204/62/002/002/001/007
I060/I242

Conversion of cyclohexane...

any noticeable increase of output of benzene. The gaseous products of catalysis wer analyzed in a XT-2M (KhT-2M) unit; the liquid products were analyzed by gas-liquid chromatography. There are 4 figures and 4 tables.

ASSOCIATION: Institut organicheskoy khimii AN SSSR im. N.D. Zelinskogo (Institute of Organic Chemistry im. N.D. Zelinskiy, AS USSR)

SUBMITTED: January 25, 1961

Card 2/2

ACCESSION NR: AT4035162 S/0000/63/000/000/0125/0130

AUTHOR: Minachev, Kh. M.; Markov, M. A.

TITLE: Investigation of the catalytic properties of the rare-earth elements in the transformation of hydrocarbons

SOURCE: AN SSSR. Institut geokhimii i analiticheskoy khimii. Redkozemel'ny*ye elementy* (Rare-earth elements). Moscow, Izd-vo AN SSSR, 1963, 125-130

TOPIC TAGS: rare earth, catalytic dehydrogenation, rare earth oxide, cyclohexane, n-heptane, ethylcyclopentane, methyl-cyclopentene, methylcyclohexene, n-heptene, dehydrogenation

ABSTRACT: In a series of experiments on the catalytic activity of the rare earth oxides, oxides of La, Nd, Sm, Gd, Ho, Er, Tu, Yb and Y were used as catalysts in the dehydrogenation of cyclohexane, n-heptane, ethylcyclopentane, 1-methylcyclopentene-1, 1-methylcyclohexene-1 and n-heptene-1. The dehydrogenation of cyclohexane was first investigated at 515-580C. Determination of the specific surface of the investigated oxides made it possible to compare their specific catalytic activity and specific coke-forming power during the reaction. Calculation showed that the activation energy for Nd_2O_3, Gd_2O_3 and Ho_2O_3 are close to the values of typical oxide catalysts, while for other oxides the values exceed 50 kcal/mole. Similar

Card 1/2

ACCESSION NR: AT4035162

results were obtained with n-heptane and cycloolefins. The isomerization of 1-methylcyclopenten-1 and 1-methylcyclohexen-1 is plotted against temperature, and the production of benzene from the latter is compared with different catalysts. Finally, the reduction of cyclohexane and n-heptane is studied over oxides of the rare-earth elements adsorbed onto activated charcoal. Such catalysts were found to be significantly more effective than the oxides alone. Orig. art. has: 7 figures and 2 tables.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii AN SSSR (Institute of Geochemistry and Analytical Chemistry, AN SSSR)

SUBMITTED: 31Oct63 DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: IC, OC NO REF SOV: 008 OTHER: 003

Card 2/2

MINACHEV, Kh.M.; MARKOV, M.A.; BOGOMOLOV, V.I.; ENGLINA, F.E.

Transformation of cyclic alcohols on neodymium oxide. Izv.AN SSSR. Ser.khim. no.1:13-17 Ja '64. (MIRA 17:4)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.

DERBENTSEV, Yu.I.; MARKOV, M.A.; ISAGULYANTS, G.V.; MINACHEV, Kh.M.; BALANDIN, A.A., akademik; Prinimala uchastiye SHCHUKINA, O.K.

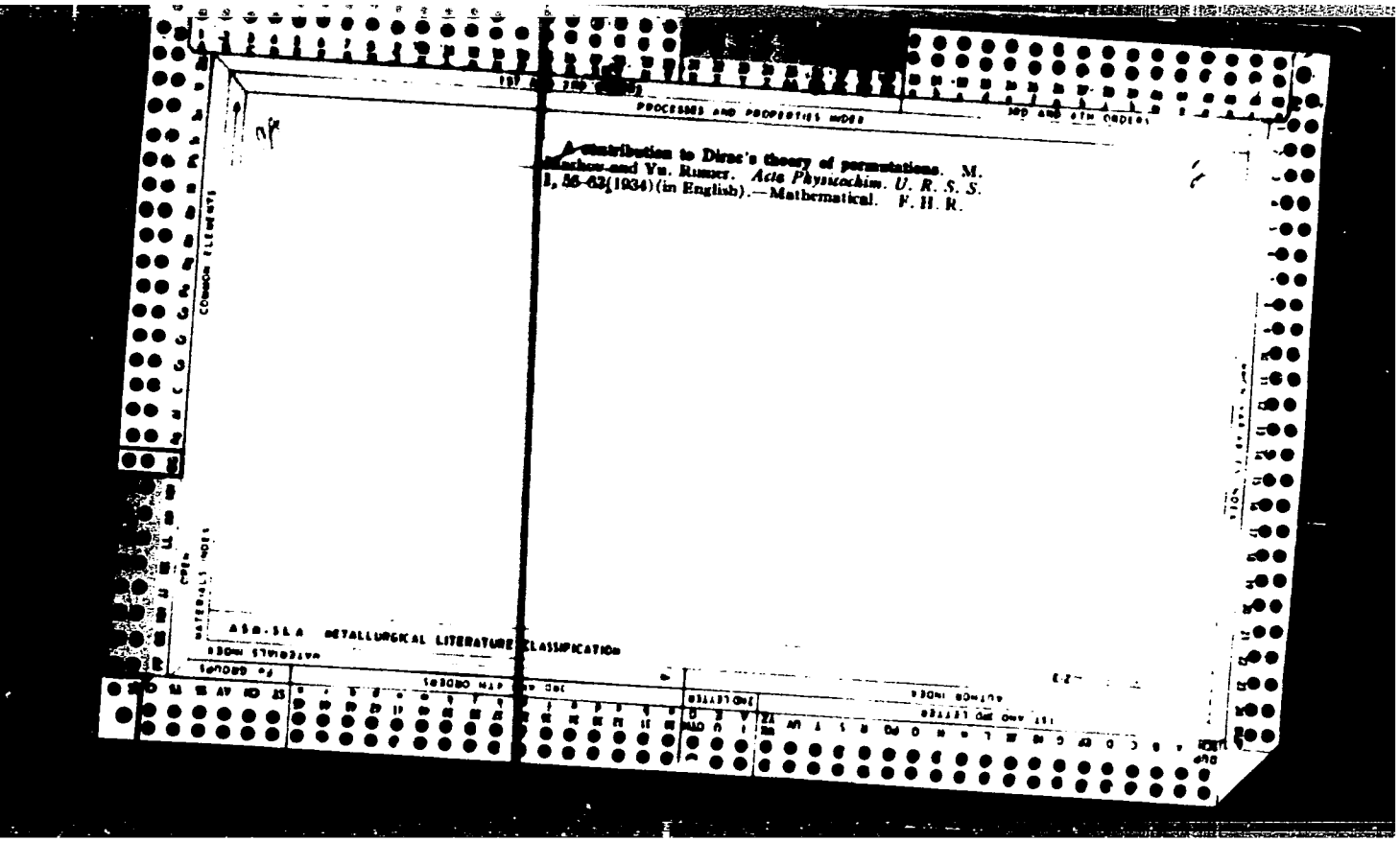
Mechanism of cyclohexane dehydrogenation over holmium oxide studied with the use of radiocarbon C^{14}. Dokl. AN SSSR 155 no.1:128-131 Mr '64. (MIRA 17:4)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.

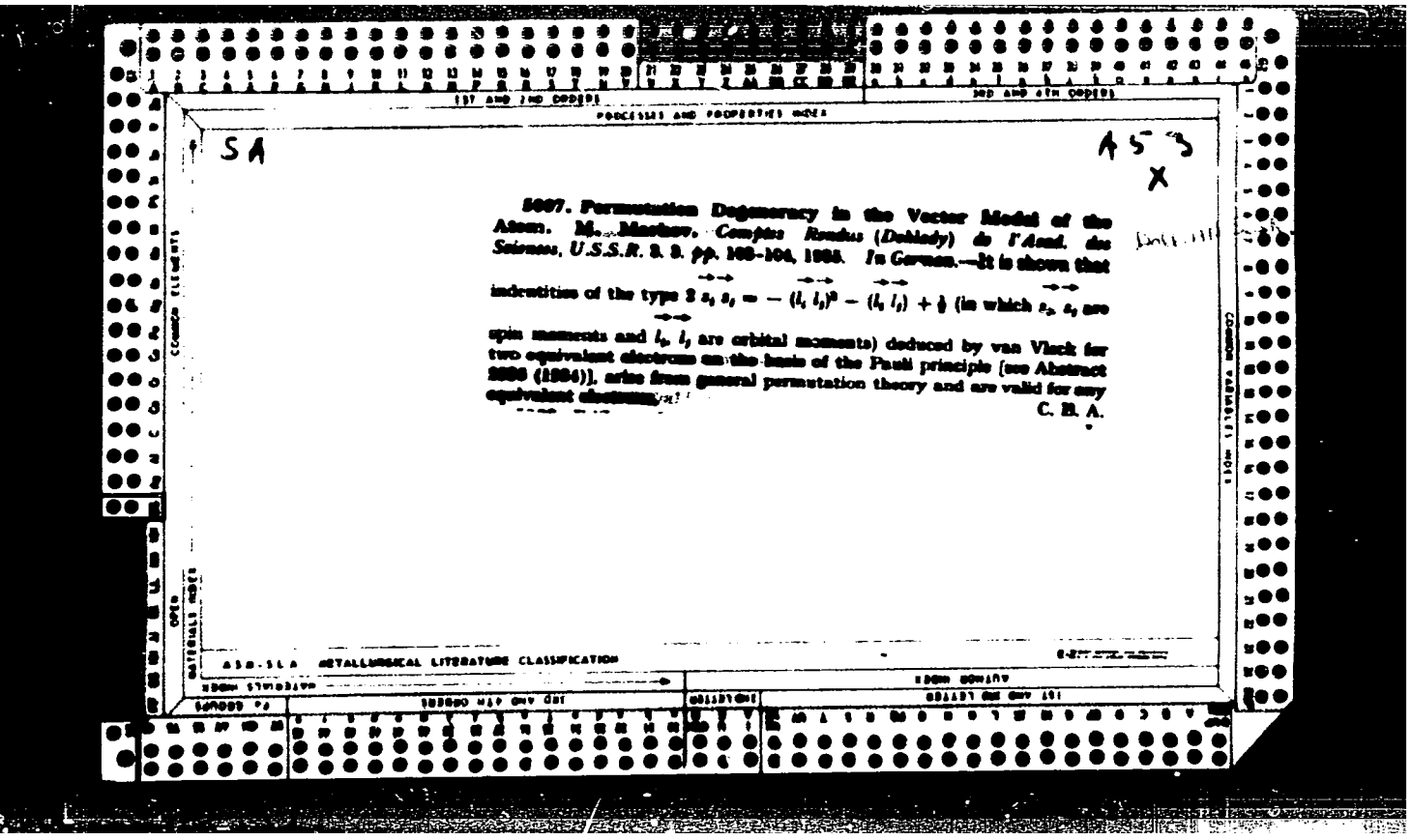
MINACHEV, Kh.M.; MARKOV, M.A.

Dehydrogenation of cyclohexane on rare-earth oxides deposited on high-ash coals. Izv. AN SSSR. Ser. khim. no.9:1680-1682 '65. (MIRA 18:9)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.

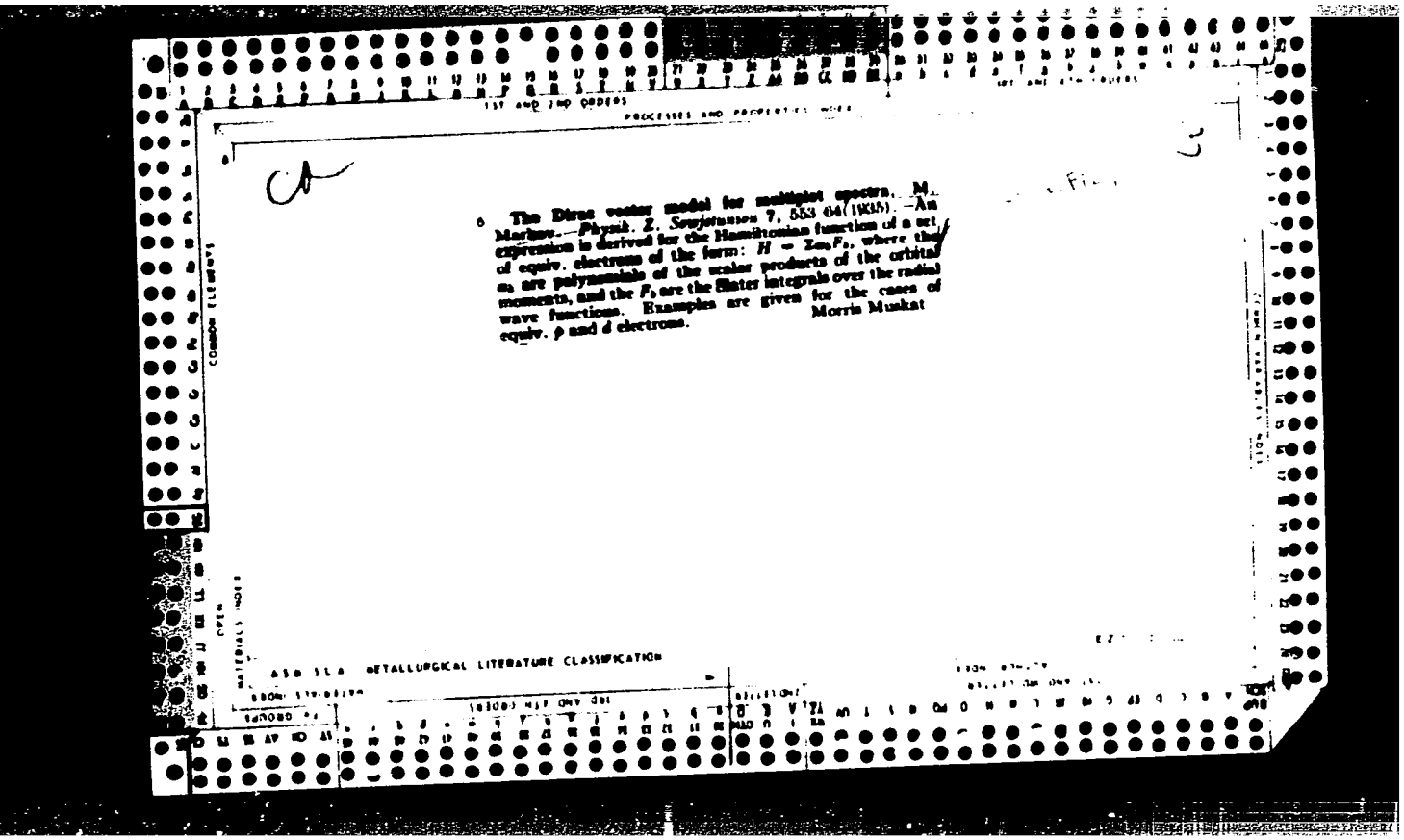


A contribution to Dirac's theory of permutations. M. Markov and Yu. Rumer. *Acta Physicochim. U. R. S. S.* 1, 55-62(1934)(in English).—Mathematical. F. H. R.

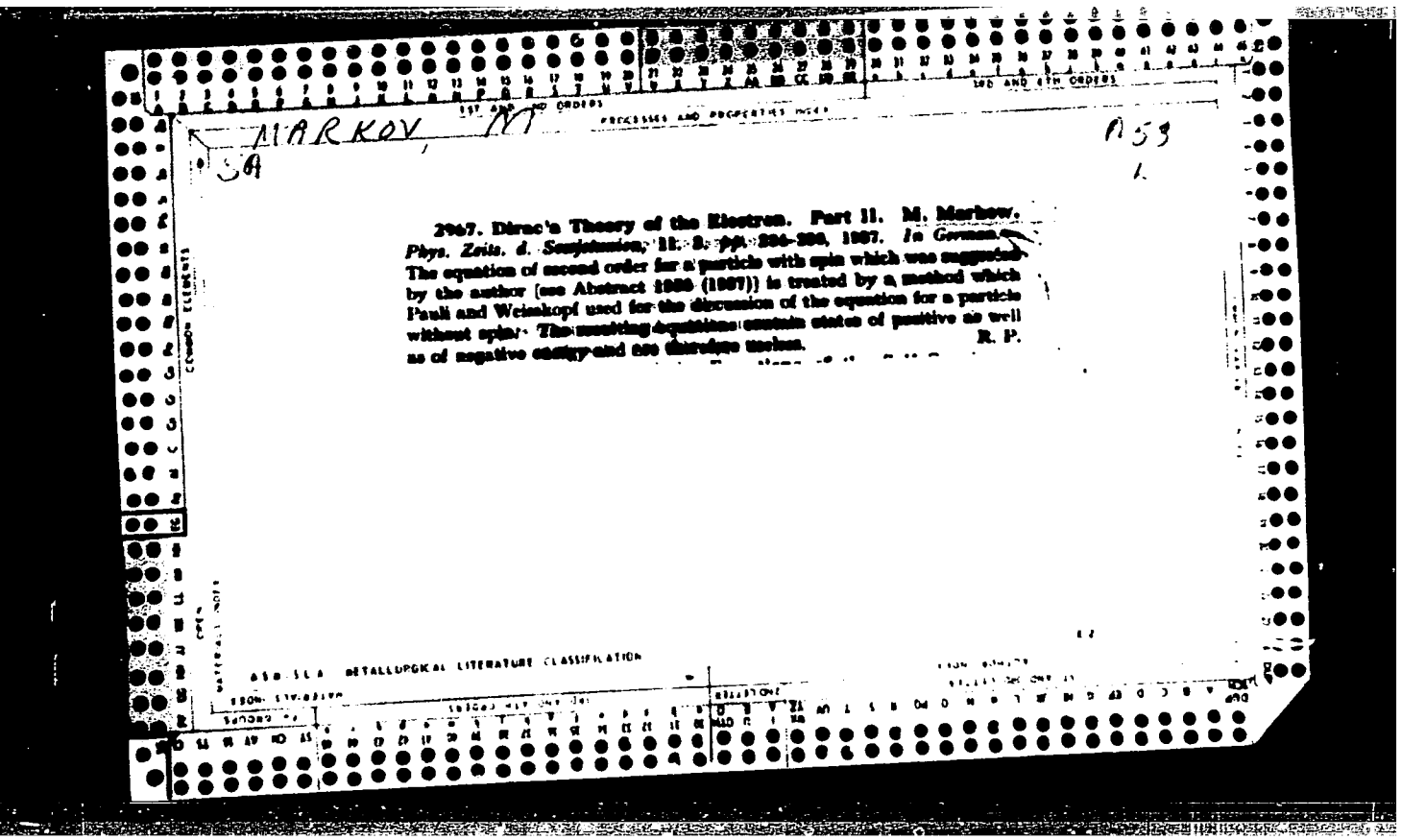


5007. **Permutation Degeneracy in the Vector Model of the Atom.** M. Minkov. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 3. 3. pp. 103-104, 1936. *In German.*—It is shown that identities of the type $3\,s_1\,s_2 = -(l_1\,l_2)^2 - (l_1\,l_2) + \frac{1}{2}$ (in which s_1, s_2 are spin moments and l_1, l_2 are orbital moments) deduced by van Vleck for two equivalent electrons on the basis of the Pauli principle [see Abstract 2008 (1934)], arise from general permutation theory and are valid for any equivalent electrons.

C. B. A.



The Dirac vector model for multiplet spectra. M. Markow.—*Physik. Z. Sowjetunion* 7, 853-64(1935). —An expression is derived for the Hamiltonian function of a set of equiv. electrons of the form: $H = \Sigma a_s F_s$, where the a_s are polynomials of the scalar products of the orbital moments, and the F_s are the Slater integrals over the radial wave functions. Examples are given for the cases of equiv. p and d electrons. Morris Muskat



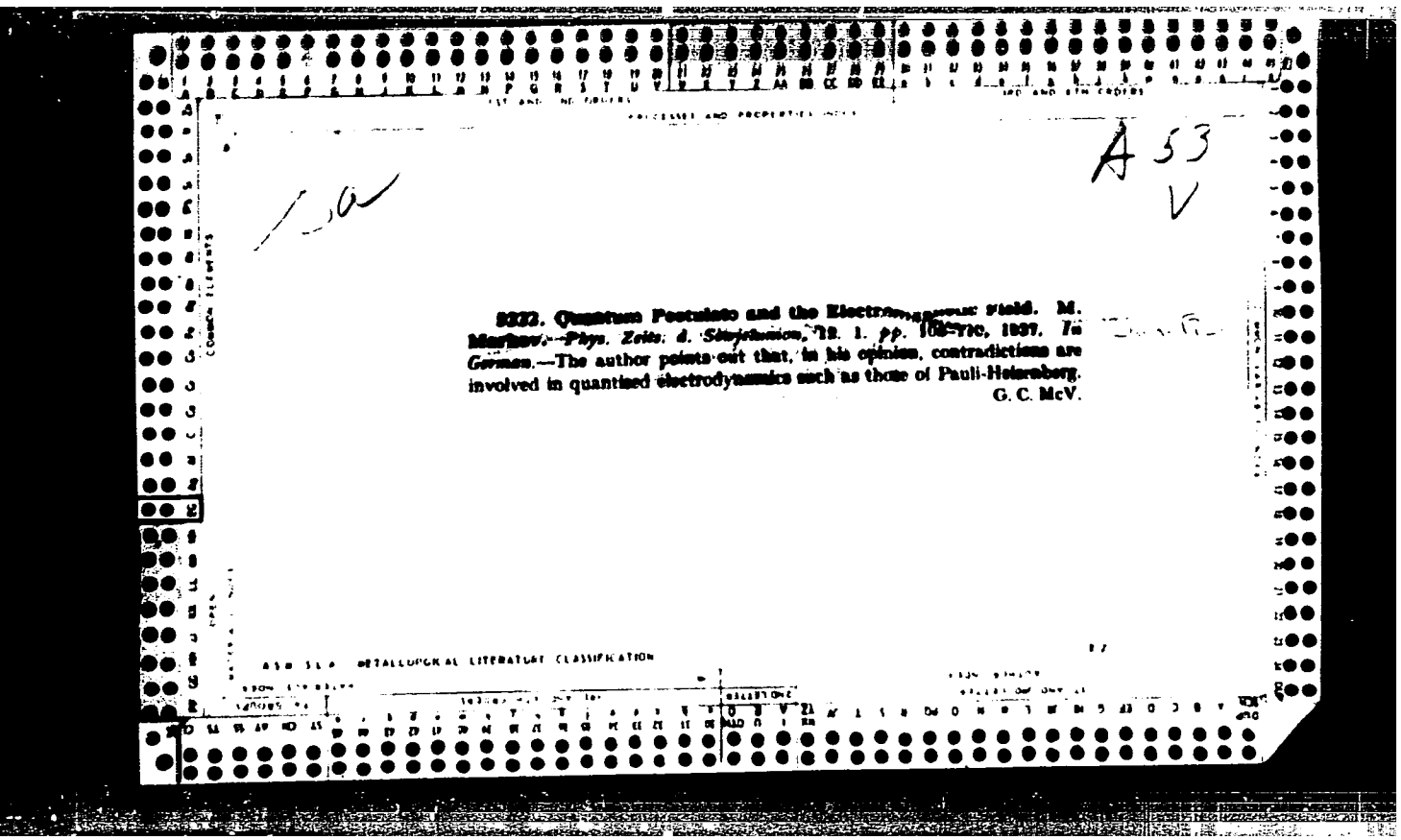
MARKOV, M

3A

A53

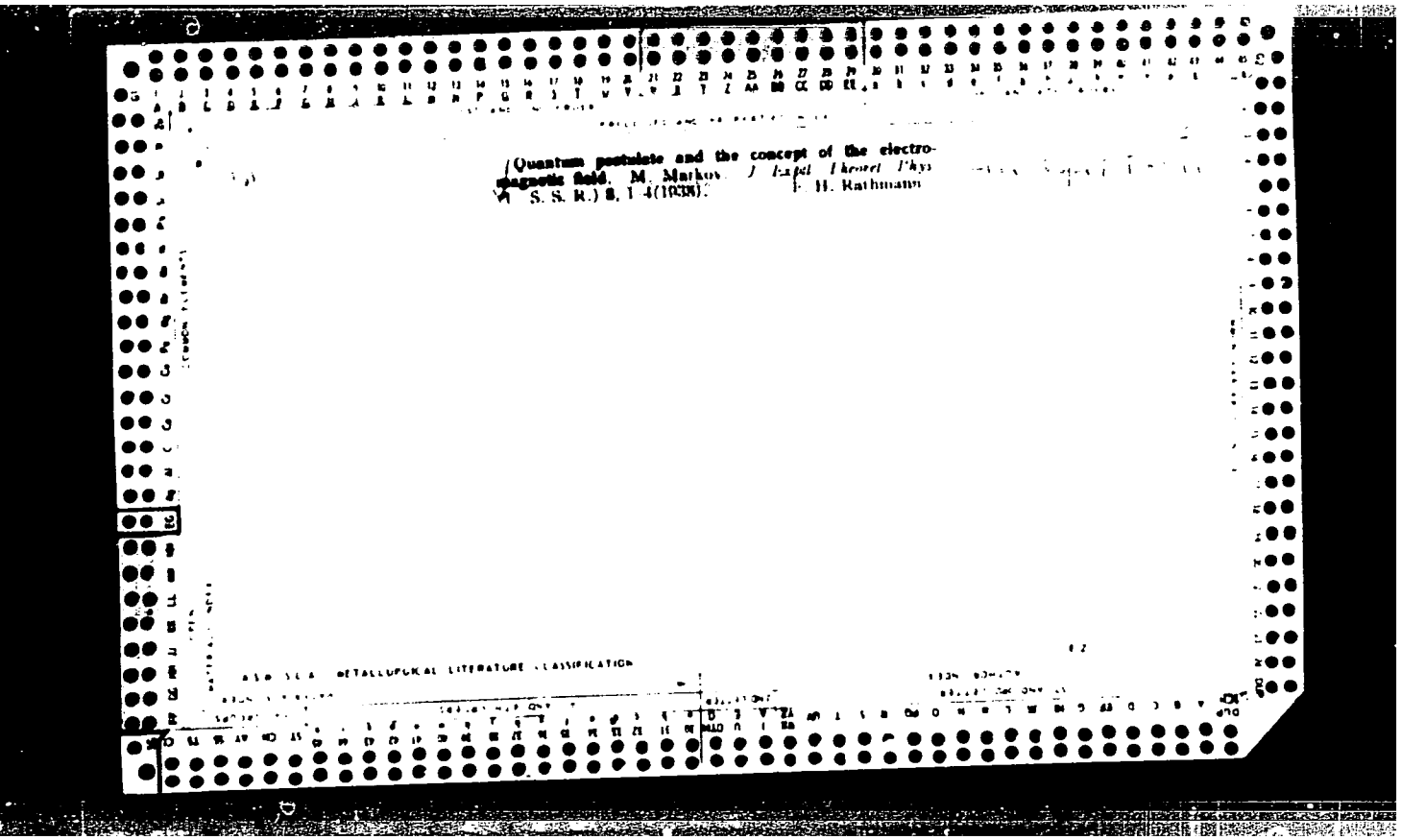
1.

2967. Dirac's Theory of the Electron. Part II. M. Markov. *Phys. Zeits. d. Sowjetunion*, 11: 3: pp. 336-350, 1937. *In German.* The equation of second order for a particle with spin which was suggested by the author (see Abstract 1935 (1937)) is treated by a method which Pauli and Weisskopf used for the discussion of the equation for a particle without spin. The resulting equations contain states of positive as well as of negative energy and are therefore useless. R. P.

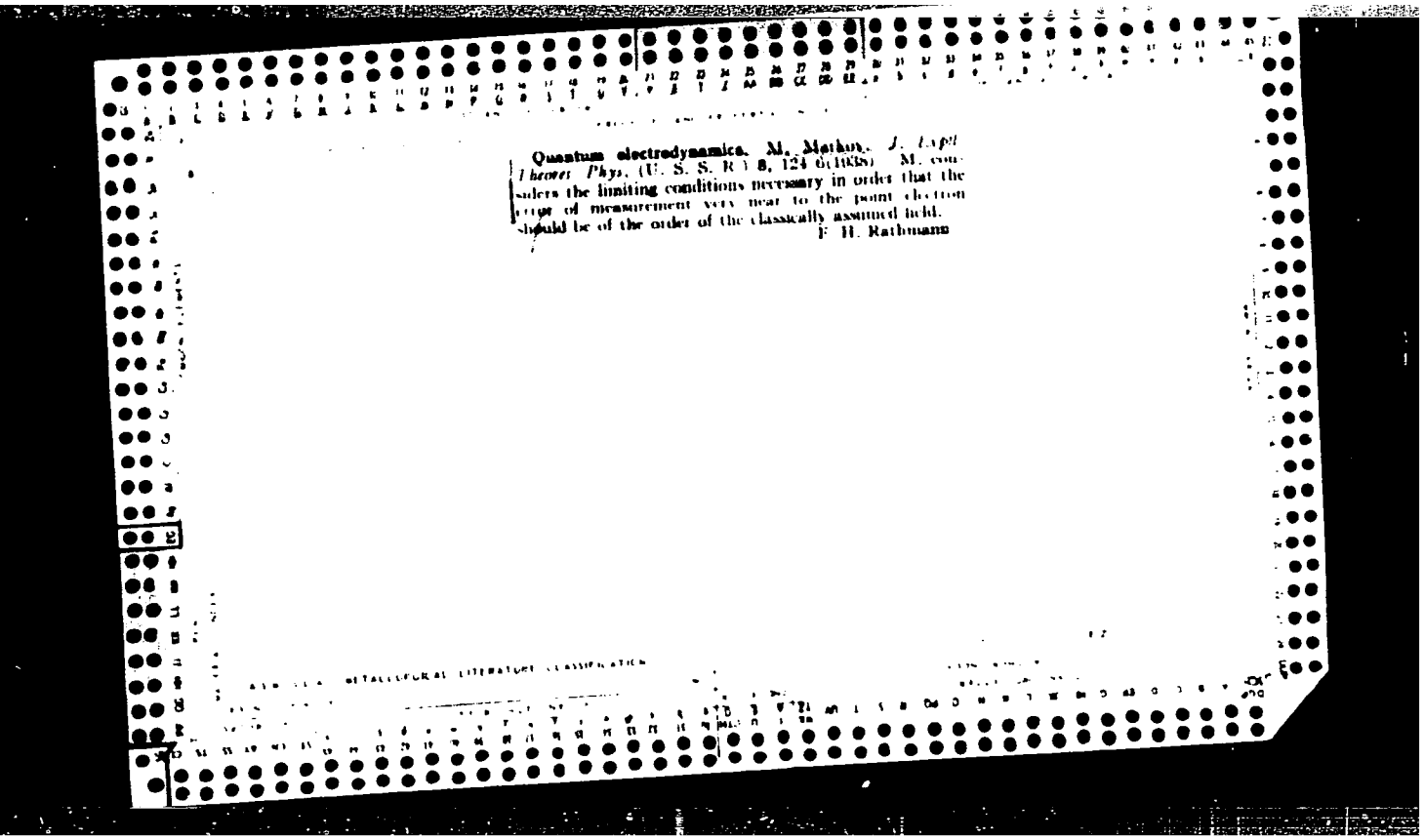


A 53
V

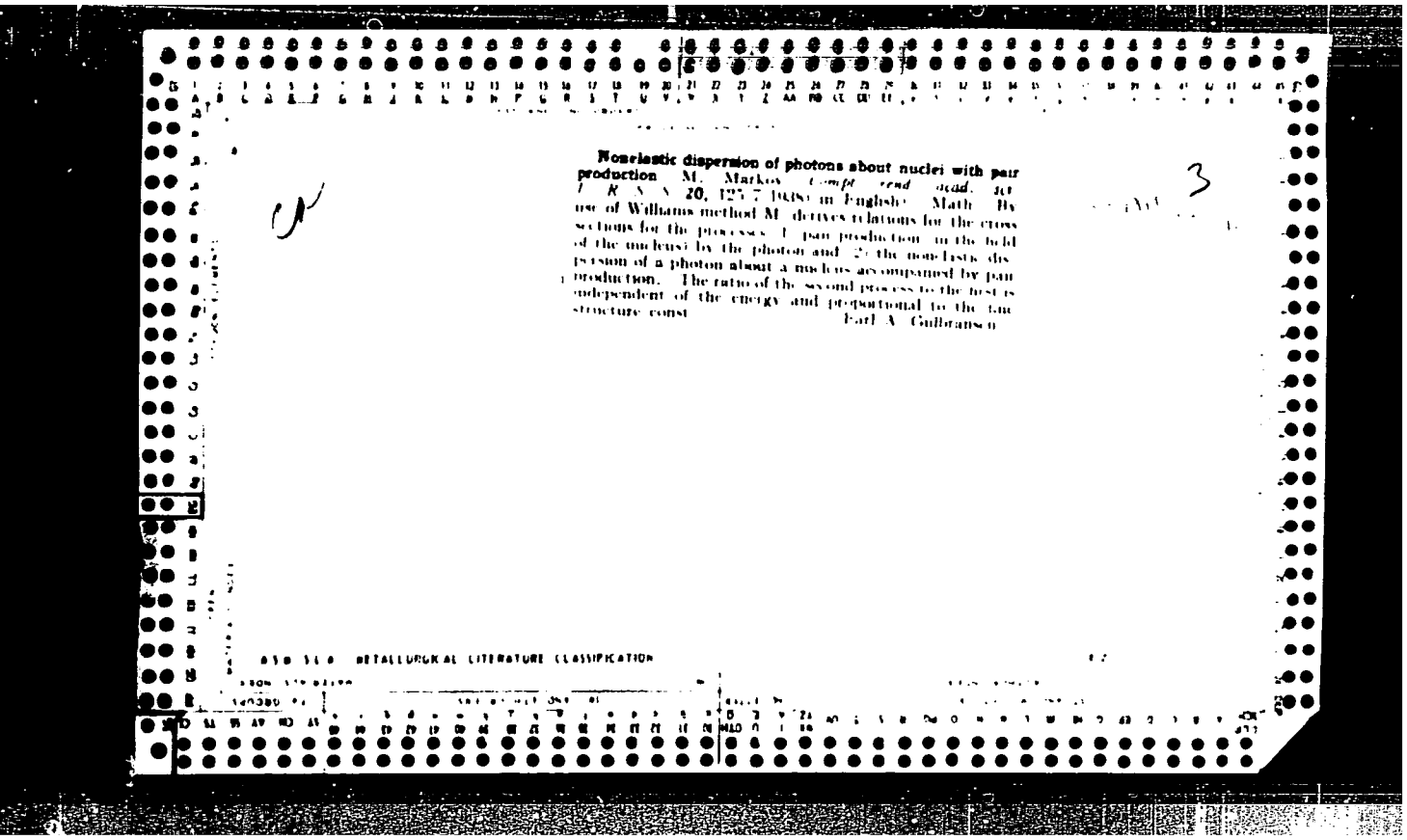
8332. Quantum Postulate and the Electromagnetic Field. M. Mayer.—*Phys. Zeits. d. Sowjetunion*, 12. 1. pp. 105–110, 1937. *In German.*—The author points out that, in his opinion, contradictions are involved in quantised electrodynamics such as those of Pauli-Heisenberg.
G. C. McV.



Quantum postulate and the concept of the electro-
magnetic field. M. Markov. J. Exptl. Theoret. Phys.
(U. S. S. R.) 8, 1-4(1938). H. Rathmann



Quantum electrodynamics. M. Markov. *J. Exptl Theoret. Phys.* (U. S. S. R.) 8, 124–6 (1938). M. considers the limiting conditions necessary in order that the range of measurement very near to the point electron should be of the order of the classically assumed field.
F. H. Rathmann

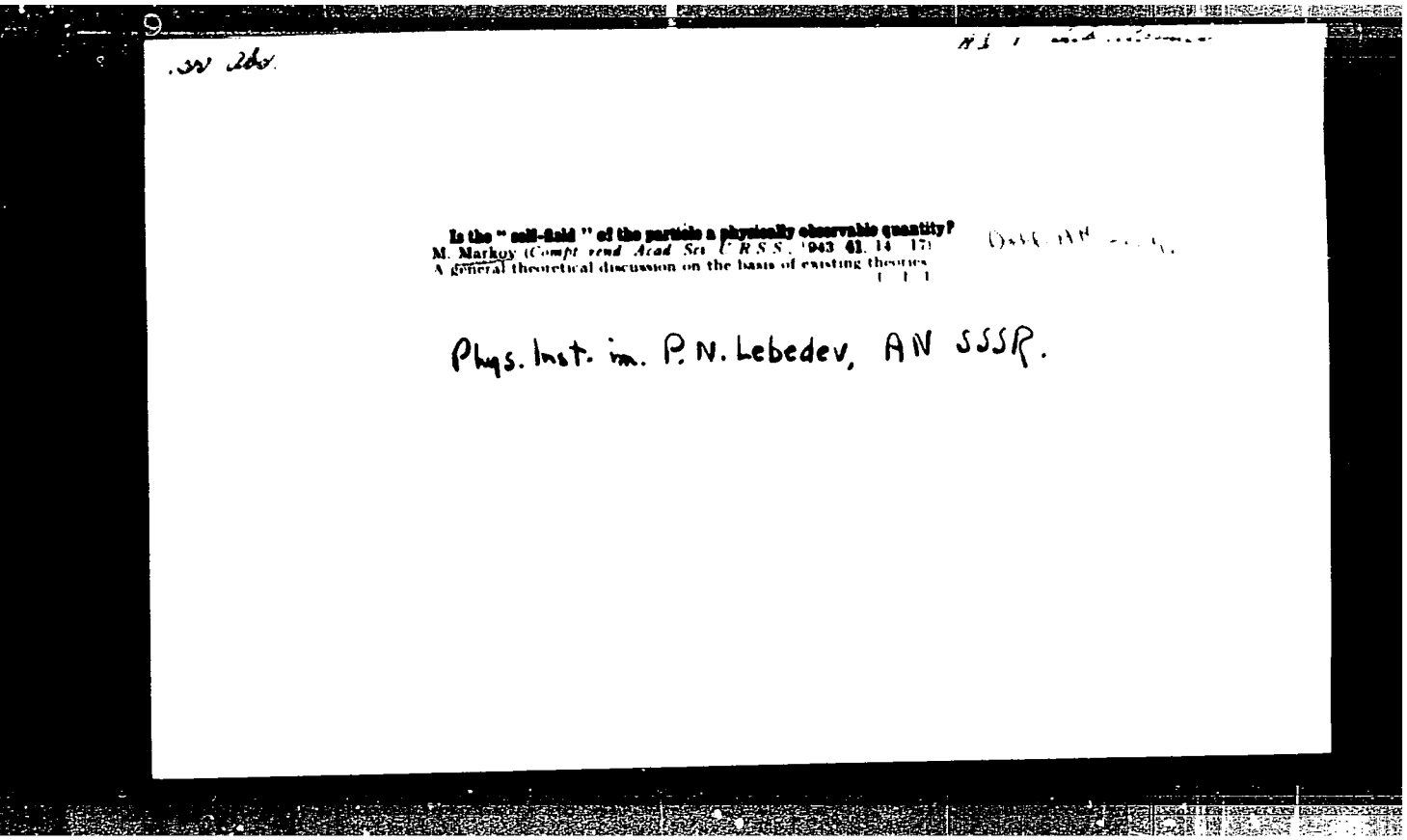


Nonelastic dispersion of photons about nuclei with pair production M. Markov *Compt. rend. acad. sci. URSS* **30**, 127-7 (1936) in English. Math. By use of Williams method M. derives relations for the cross sections for the processes 1. pair production in the field of the nucleus by the photon and 2. the nonelastic dispersion of a photon about a nucleus accompanied by pair production. The ratio of the second process to the first is independent of the energy and proportional to the fine structure const

Earl A. Coddington

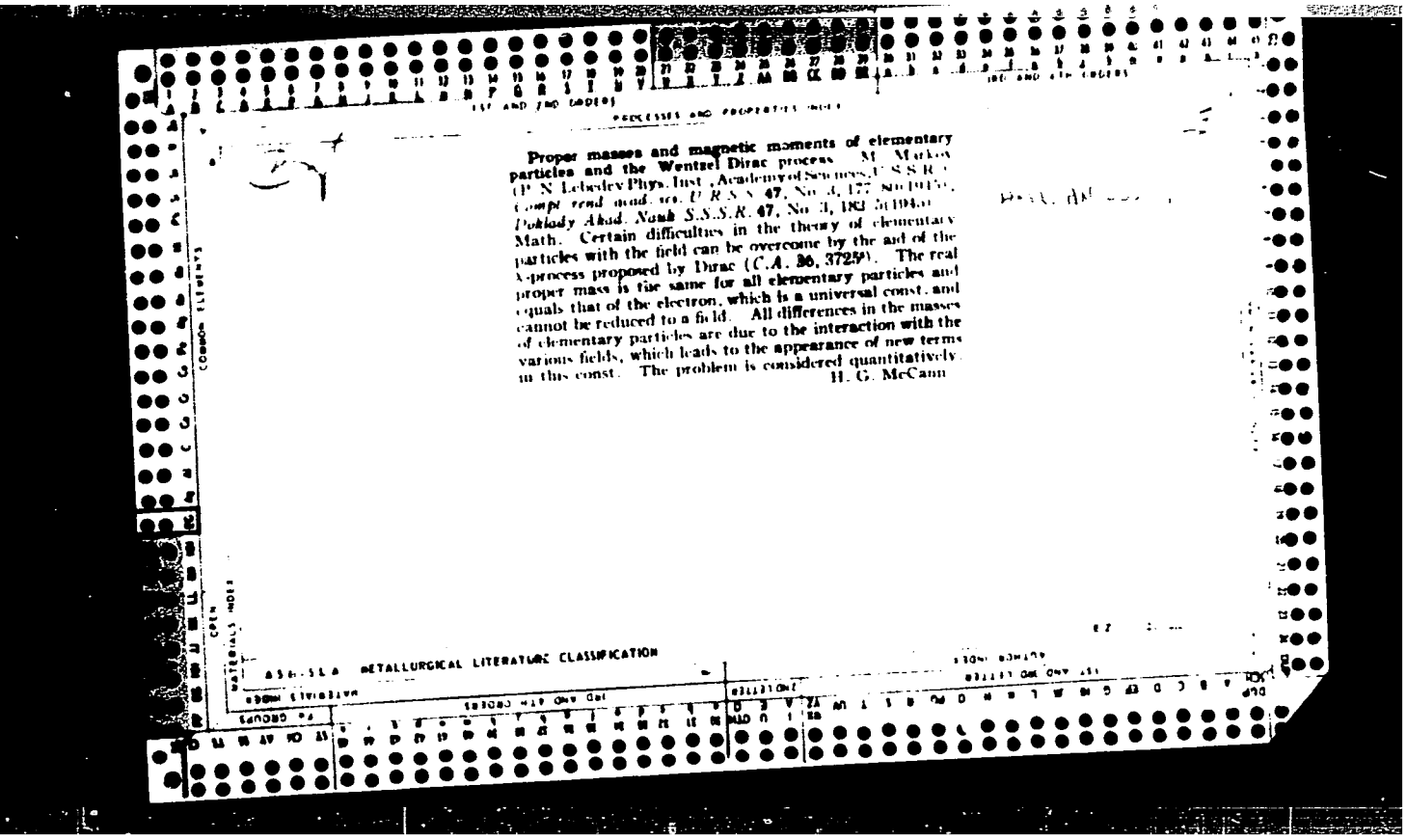
MARKOV, M. A.

"Role of the Zero-State of Radiation Oscillators in the Higher Approximations of Quantum Electrodynamics," Dok.AN, 23, No.9, 1939. Inst. Physics. Acad. Sci., [illegible].
"Concerning the Four Dimensional-Expanded Electron Relitivistic Quantum Zone" Zhur. ~~Phys~~., 453, No. 6, Vol. II, 1940
"On the Relativistically Invariant (Cutting-Of Factor) In Electrodynamics," Dok.AN, 40, No.1, 1943. P.N. Lebedev Phys. Inst., Acad. Sci. cl943-.
"Electrodynamics of Dirac-Fock-Podolsky and the Self-Energy of the Electron," Dok.AN, 40, No.6, 1943. P.N. Lebedev Phys. Inst, Acad. Sci. cl943-.
"The Many Body Problem in the Classical Relativistic Theory", Zhur. ~~Phys~~., N2, No. 1. Vol. VII, 1943
P. N. Lebedev Physical Institute, Academy of Science of the USSR, cl941-.
"On the Criterion of Relativistic Invariance," Zhur. Eksper. i Teor. ~~Fiz~~. Fiz., 16, No. 9, 1946. Lebedev Physical Inst., Acad. Sci. USSR, -1946-.



Is the "self-field" of the particle a physically observable quantity?
M. Markov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **41**, 14–17)
A general theoretical discussion on the basis of existing theories

Phys. Inst. im. P. N. Lebedev, AN SSSR.



Proper masses and magnetic moments of elementary particles and the Wentzel Dirac process. M. Markov (P. N. Lebedev Phys. Inst., Academy of Sciences, U.S.S.R.). *Compt. rend. acad. sci. U.R.S.S.* **47**, No. 4, 177 (1945); *Doklady Akad. Nauk S.S.S.R.* **47**, No. 3, 182 (1945). Math. Certain difficulties in the theory of elementary particles with the field can be overcome by the aid of the A-process proposed by Dirac (*C.A.* **30**, 3725⁹). The real proper mass is the same for all elementary particles and equals that of the electron, which is a universal const. and cannot be reduced to a field. All differences in the masses of elementary particles are due to the interaction with the various fields, which leads to the appearance of new terms in this const. The problem is considered quantitatively. H. G. McCann

PA 54T91

MARKOV, M.

USSR/Physics Jul/Aug 1946
Relativity
Quantum Mechanics

"A Certain Criterion of Relativistic Invariance," M. Markov, Lebedev Phys Inst, Acad Sci USSR, 8 pp

"Journal of Physics USSR" Vol X, No 4

Attempt to remove field theory difficulties by use of Hamilton-Jacobi equation, quantum equations of motion, Dirac's many-time formalism and Heitler-Peng "calculation scheme," considered from viewpoint of criterion of relativistic invariance. Received, 19 Aug 1945.

[redacted] 54T91

Markov, M. — 8 — 7

Markov, M., On the back action of the electromagnetic field on a moving electron. Acad. Sci. USSR. J. Phys. 10, 159–166 (1946).

The author discusses some one-dimensional solutions of the classical system of equations describing the motion of an extended electron subject to the influence of its own and an external electromagnetic field. The basic equations used are those due to Lorentz. In these equations the electromagnetic fields due to the charge and current density are eliminated by using the results of Belousov [Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fis. 9, 658–669 (1939)], who has given a general solution of the Maxwell field equations for arbitrary charges and current densities in terms of Fourier integrals. When this is done one is left with a system of integral equations for the acceleration vector of the center of gravity of the electron. These equations are discussed in the one-dimensional nonrelativistic case, where they reduce to

$$m\ddot{z} = -(4/3)e^4/c^3 \int_0^\infty \int_{-\infty}^{t} \ddot{z}(s) k \sin kc(t-s) f^2(k) ds dk + F,$$

where m is the inertial mass of the electron, e its charge, c the velocity of light, $\ddot{z}$ the acceleration of the electron and F the external force. The function $f(k)$ is determined in terms of the charge density by $f(k) = \int \rho(r) e^{ikr} dv$. The Dirac modification of the classical Lorentz theory of the electron [Proc. Roy. Soc. London. Ser. A. 167, 148–169 (1938); 180, 1–40 (1942); Communications Dublin Inst. Advanced Studies, Ser. A, no. 1 (1943); these Rev. 5, 277; 7, 100] is included in this treatment by setting $f^2(k) = \cos k\lambda$.

The author then discusses various methods for handling the improper integrals involved and claims that solutions of the form Be^{nt} cannot be obtained if the process of taking the limit $\lambda \to 0$ is employed at the proper time, that is, after the integral equation is solved. The argument leading to this assertion is not convincing. *A. H. Taub.*

Source: Mathematical Reviews, Vol. 8, No. 3

MARKOV, M.A.

(Markov, M.) On a certain criterion of relativistic invariance. Acad. Sci. USSR. J. Phys. 10, 333-340 (1946).

If two points in space time are such that the vector joining them is space-like then the measurement of one physical quantity M at one of these points cannot react on the measurement of a quantity N at the second of these points. That is, the operators representing these quantities at the respective points must commute. The author applies this principle of "causal independence" to the operators representing the vector potential of an electromagnetic field and the Dirac-Hamiltonian for a system of n electrons interacting with this field. He uses the Dirac-Fock-Podolsky many time formalism to obtain a condition on the factors introduced by any "cut-off" process for the Fourier expansion of the vector potential. Introducing such cut-off factors is equivalent to modifying the commutation equations for the Fourier components of the vector potential. When these are written as $[A^{\pm}_{\mu}(k_r), A^{\pm}_{\nu}(k_r')] = c(k_r, \lambda)\delta_{\mu\nu}$, instead of $[A^{\pm}_{\mu}(k_r), A^{\mp}_{\nu}(k_r')] = \delta_{\mu\nu}$, the function $c(k, \lambda)$ cannot be arbitrary but must satisfy the condition referred to above. The author shows that, if $c = e^{\alpha\lambda}$, $\alpha = 1, 2, 3, 4$, this condition is violated and hence the principle of causal independence at two relatively space-like points does not hold. He interprets the result as follows. The introduction of the function $e^{\alpha\lambda}$ in the commutation relations is equivalent to postulating a certain charge distribution for the electron, as may be seen from an application of the many time formalism. Signals are propagated across this charge distribution at a velocity greater than that of light and as a result the causal independence principle is violated. He then states that any choice of an integrable function for $c(k, \lambda)$ would determine a charge distribution and the same difficulty would then arise.

The author then reviews the singular function $c(k, \lambda)$ introduced in the Wentzel-Dirac limiting process and a generalization of this function. He also reviews the Heitler-Peng "calculation scheme" [Proc. Cambridge Philos. Soc. 38, 296-312 (1942)] in light of the causal independence principle and finds that this principle is satisfied.

A. H. Taub (Seattle, Wash.).

Source: Mathematical Reviews, Vol 8, No. 5

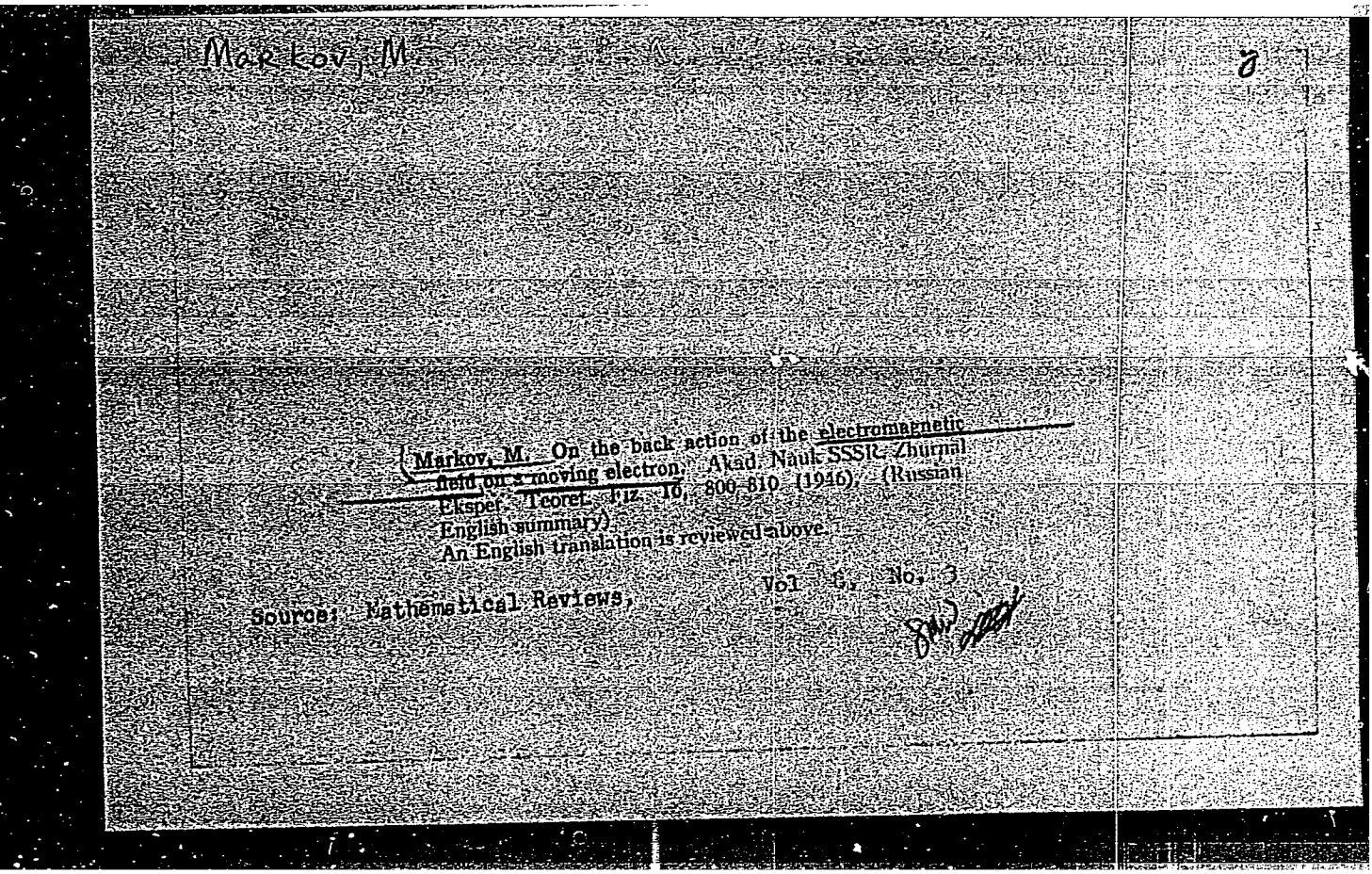
Markov, M. A.

Markov, M. A. On the criterion of relativistic invariance. Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 16, 799–804 (1946). (Russian. English summary)

[Reviewer's note: the Russian title should be translated "On a criterion of relativistic invariance."] Any relativistic theory based on the notion of space-time continuum ought to satisfy the following condition. (C) If (r_1, t_1) and (r_2, t_2) are two world points which cannot be connected by a light signal, i.e., if the inequality $c|t_1-t_2|<|r_1-r_2|$ holds, any two events at these world points must not influence one another. The formal relativistic invariance of a theory does not necessarily imply the condition (C). Using Dirac's "many-time" formalism the author investigates, from this point of view, several possible forms of quantum electrodynamics (partly generalizing those which have appeared in the literature). In order to overcome the well-known convergence difficulties, in most of these theories a four vector λ is introduced, which is then made to tend to zero. The author shows that as long as $\lambda \neq 0$ these theories do not satisfy the condition (C). [Reviewer's note. Since it is impossible to select a nonvanishing four vector in an invariant fashion, these theories cannot be considered relativistically invariant for $\lambda \neq 0$ unless the components of λ are introduced as variables which describe new degrees of freedom of the system in question. So far only the limiting case $\lambda \to 0$ has been assumed to be physically significant.] In the last section the author briefly discusses the "computational scheme" of Heitler and Peng [Proc. Cambridge Philos. Soc. 38, 296–312 (1942)] and Heisenberg's S-matrix [Z. Physik 120, 513–538 (1943); these Rev. 4, 292]. A fuller discussion is reserved for a later publication. [A translation appeared in Acad. Sci. USSR. J. Phys. 10, 333–340 (1946); these Rev. 8, 303.]

V. Bargmann (Princeton, N. J.).

Source: Mathematical Reviews, Vol 8 No. 7



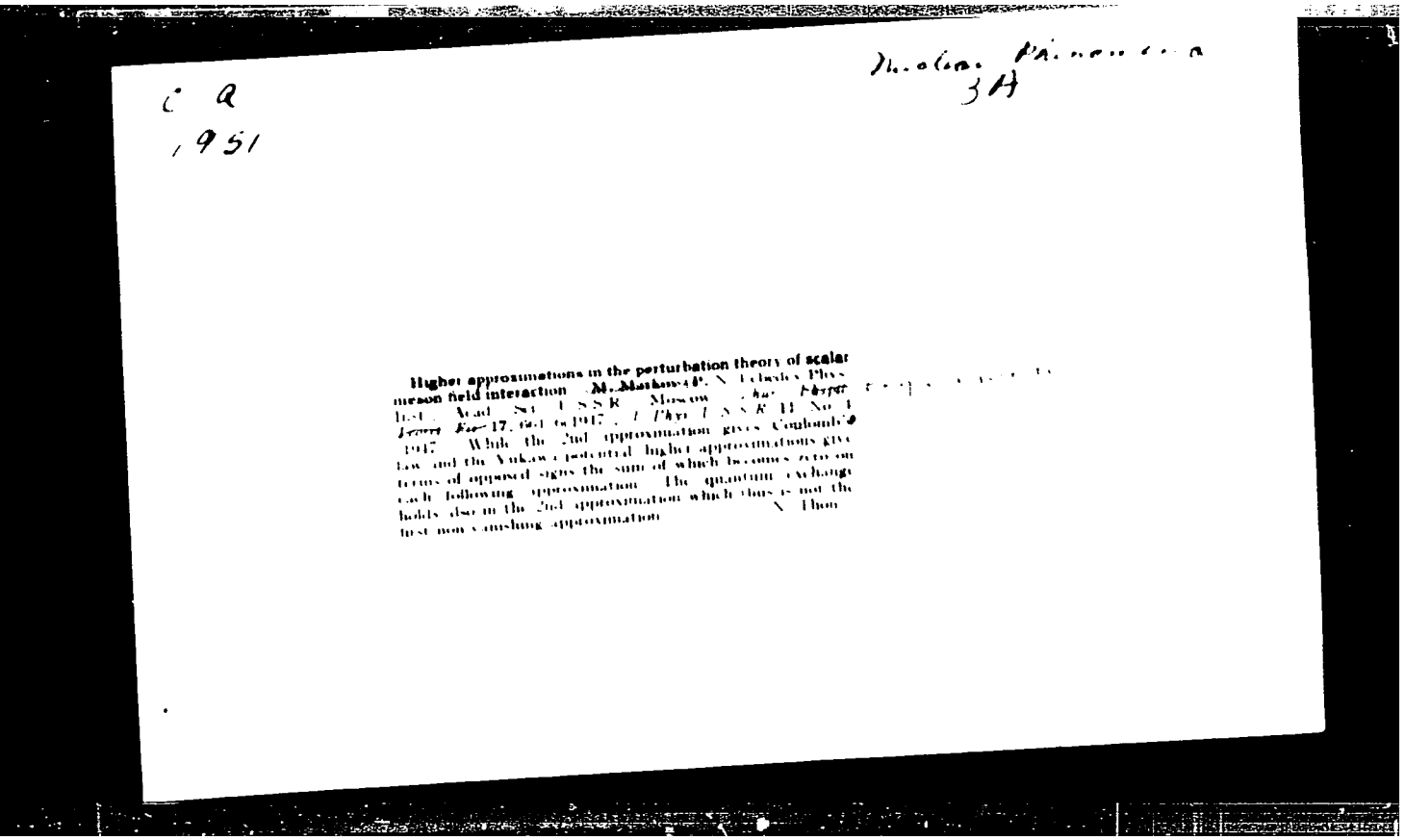
Markov, M.

3

Markov, M. On the back action of the electromagnetic field on a moving electron. Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 16, 800-810 (1946). (Russian English summary)

An English translation is reviewed above.

Source: Mathematical Reviews, Vol 8, No. 3



C Q
1951

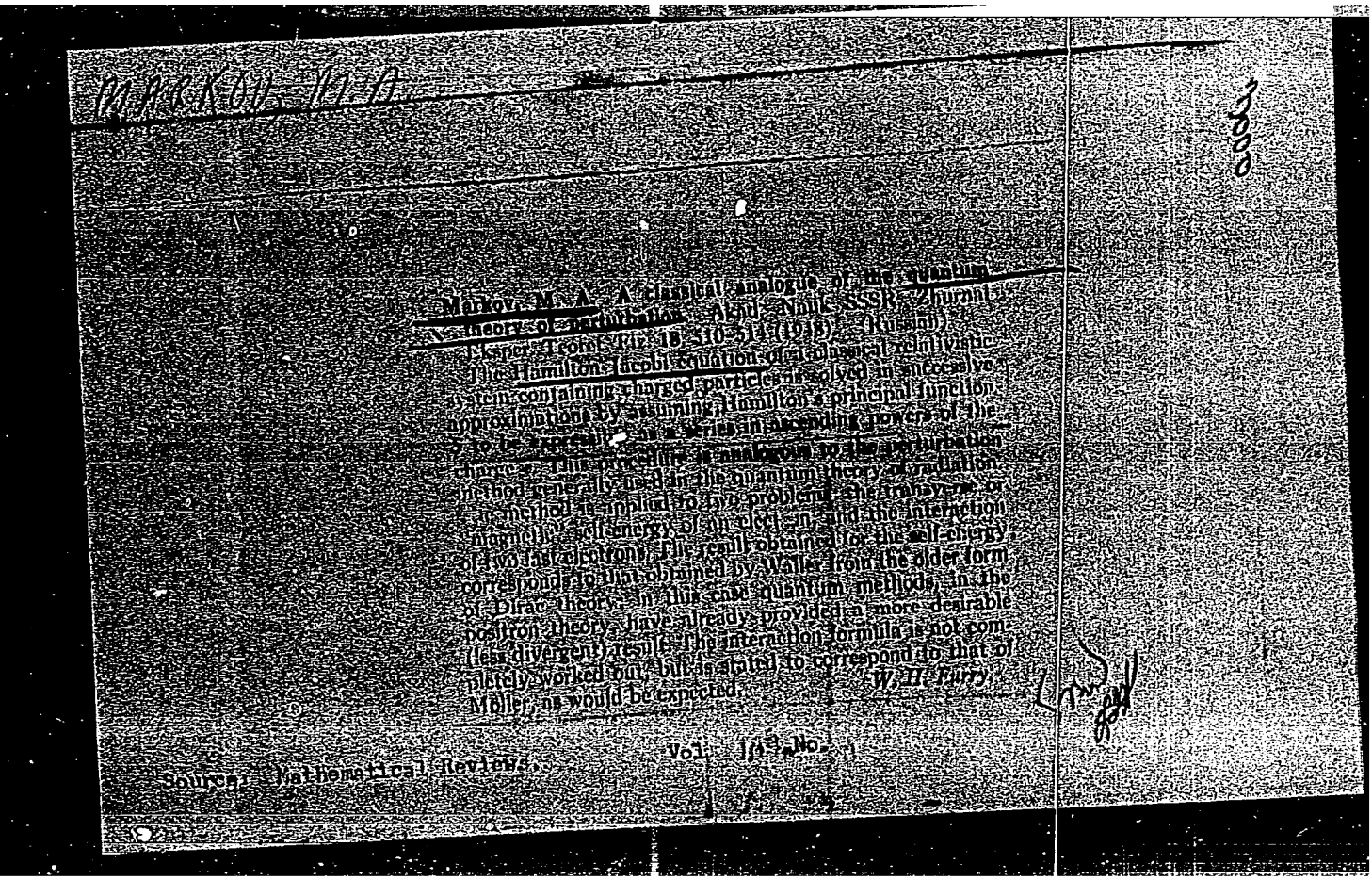
Nuclear Physics
3A

Higher approximations in the perturbation theory of scalar meson field interaction. M. Markov. (Acad. Sci. USSR, Moscow.) Zhur. Eksper. Teoret. Fiz. 17, 041 to 047, 1947. (Phys. J. USSR 11 No. 1 1947.) While the 2nd approximation gives Coulomb's law and the Yukawa potential higher approximations give terms of opposed signs the sum of which becomes zero on each following approximation. The quantum exchange holds also in the 2nd approximation which thus is not the first non vanishing approximation. Then

MARKOV, M.

Letter to the editor on the limiting λ-process. Zhur.eksp.i teor.fiz. 17 no.9:848 '47. (MLRA 6:7)

1. Fizicheskiy institut im. P.N.Lebedeva Akademii Nauk SSSR. (Quantum theory)



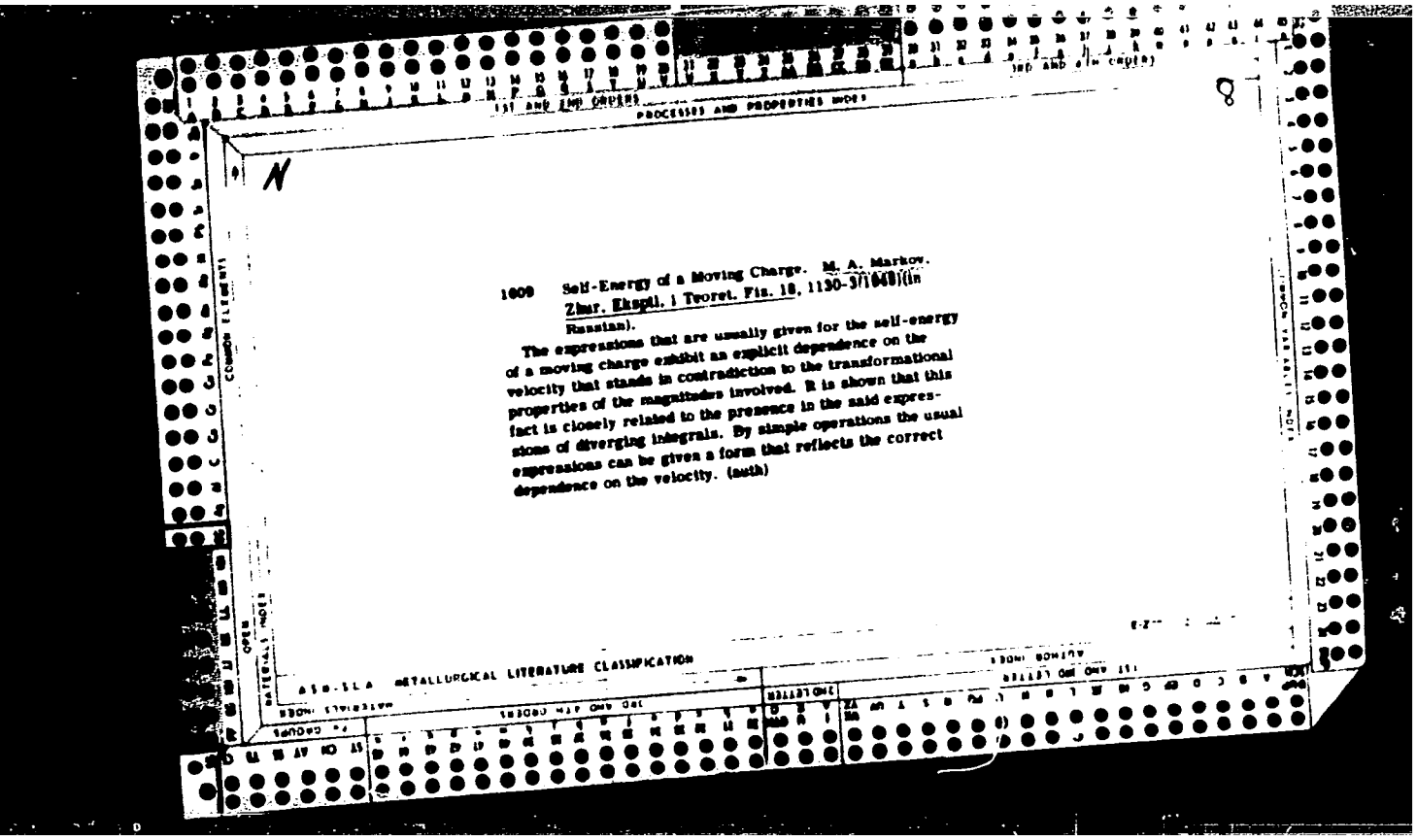
MARKOV, M. A.

Markov, M. A. A classical analogue of the quantum theory of perturbations. Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 18, 310-314 (1948). (Russian)

The Hamilton-Jacobi equation of classical relativistic mechanics of a system containing charged particles is solved in successive approximations by assuming Hamilton's principal function S to be expressible as a series in ascending powers of the charge e. This procedure is analogous to the perturbation method generally used in the quantum theory of radiation. The method is applied to the problem of the transverse or magnetic self-energy of an electron and the interaction of two fast electrons. The result obtained for the self-energy corresponds to that obtained by Waller from the older form of Dirac theory. In this case quantum methods, in the positron theory, have already provided a more desirable (less divergent) result. The interaction formula is not completely worked out, but is stated to correspond to that of Møller, as would be expected.

W. H. Furry

Source: Mathematical Reviews, Vol. 10, No. 1



1009 Self-Energy of a Moving Charge. M. A. Markov. Zhur. Eksptl. i Teoret. Fiz. 18, 1130-9(1948)(in Russian).

The expressions that are usually given for the self-energy of a moving charge exhibit an explicit dependence on the velocity that stands in contradiction to the transformational properties of the magnitudes involved. It is shown that this fact is closely related to the presence in the said expressions of diverging integrals. By simple operations the usual expressions can be given a form that reflects the correct dependence on the velocity. (auth)

PA 19/49T109

MARKOV, M. A.

USSR/Nuclear Physics - Radioactivity Oct 48
Nuclear Physics - Neutrino

"Theory of the Beta Decomposition in the Case of a Low Upper Boundary for the Beta-Spectrum and the Neutrino Mass," M. A. Markov, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 4 pp

"Zhur Eksper i Teoret Fiz" Vol XVIII, No 10

Examines beta decomposition assuming that neutrino mass is not zero. In cases of low upper beta-spectrum boundary, mass of neutrino plays essentially different role in variants of beta-decomposition theory. Results are illustrated using H^3 as example. Submitted 20 Apr 48.

19/49T109

MARKOV, M.

USSR/Nuclear Physics - Electrons, Pair Theory
Nuclear Physics - Neutrettos

Feb 49

"The Pair Theory of Nuclear Forces," Ye. Lomsadze, M. Markov, Moscow State U, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 3 pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 2

Shows that the neutretto and antineutretto lead to different laws of reaction in the theory of pair nuclear forces (spin of neutretto $\frac{1}{2}$)

PA32/49T76

USSR/Nuclear Physics - Mesotrons, Apr 49
Capture by Nuclei
Nuclear Physics - Mesotrons, Pair
Production

"The Capture of Negative Mesons by Atomic Nuclei From the Standpoint of the Pair Theory of Nuclear Forces," V. Lebedev, M. Markov, Moscow State U; Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 5 pp

"Zhur. Eksper. i Teoret Fiz." Vol XIX, No 4

Attempts to clarify experimental data on meson capture by atomic nuclei using the pair

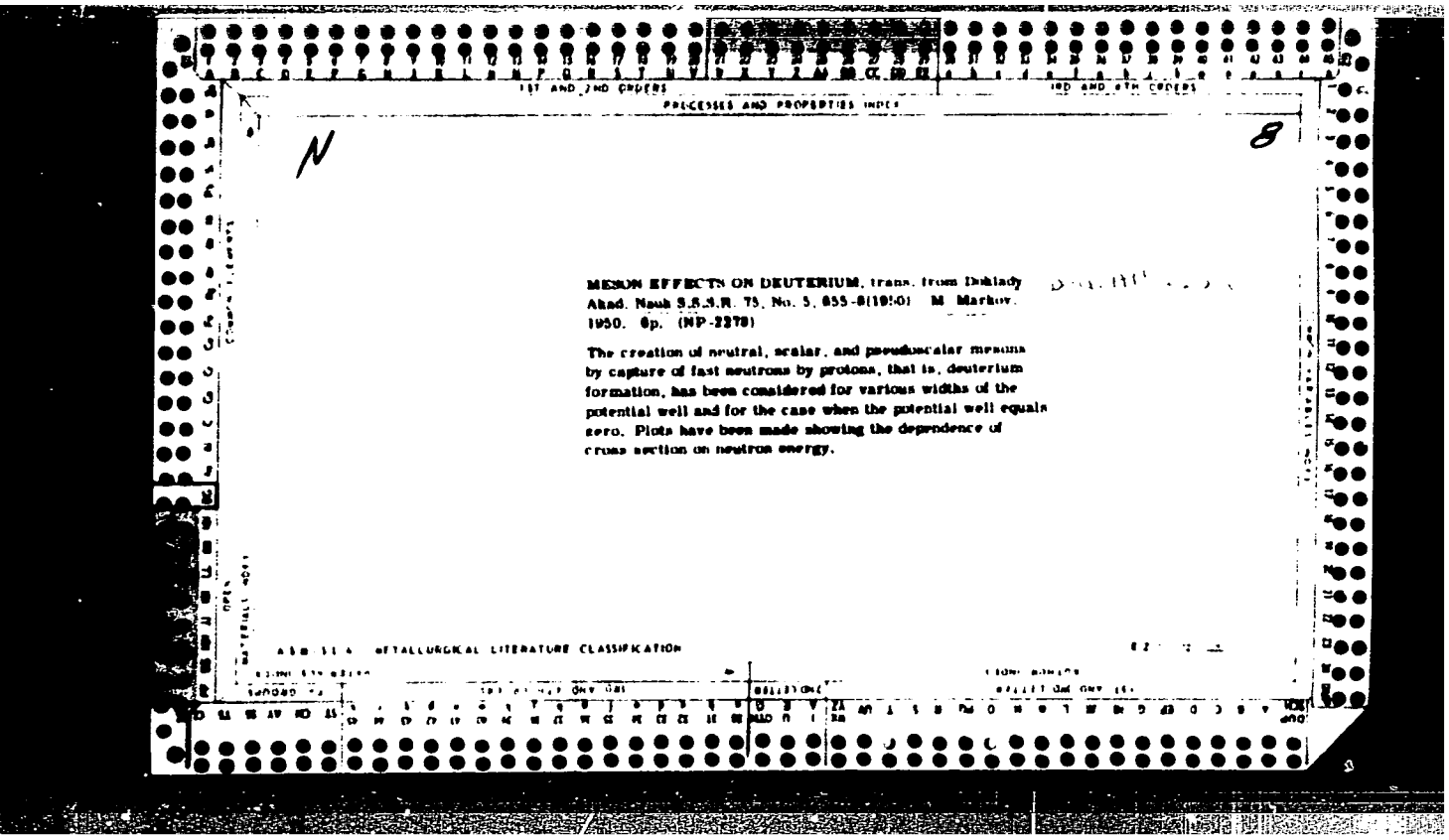
38/49T101

PA 38/49T101

USSR/Nuclear Physics - Mesotrons, Apr 49
Capture by
Nuclei (Contd)

theory of meson forces. Concludes that negative meson will be captured by Fe^{56}, Al^{27}, and S^{32} nuclei with probability greater than the probability of spontaneous disintegration of the meson in the energy interval from ~2 MeV to 0. The capture of mesons by C^{12} and Be^{7} nuclei for the same stipulations is absolutely forbidden. Submitted 10 Jul 48.

38/49T101



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

N

8

MESON EFFECTS ON DEUTERIUM, trans. from Doklady Akad. Nauk S.S.S.R. 75, No. 5, 655-8(1950) M. Markov. 1950. 6p. (NP-2278)

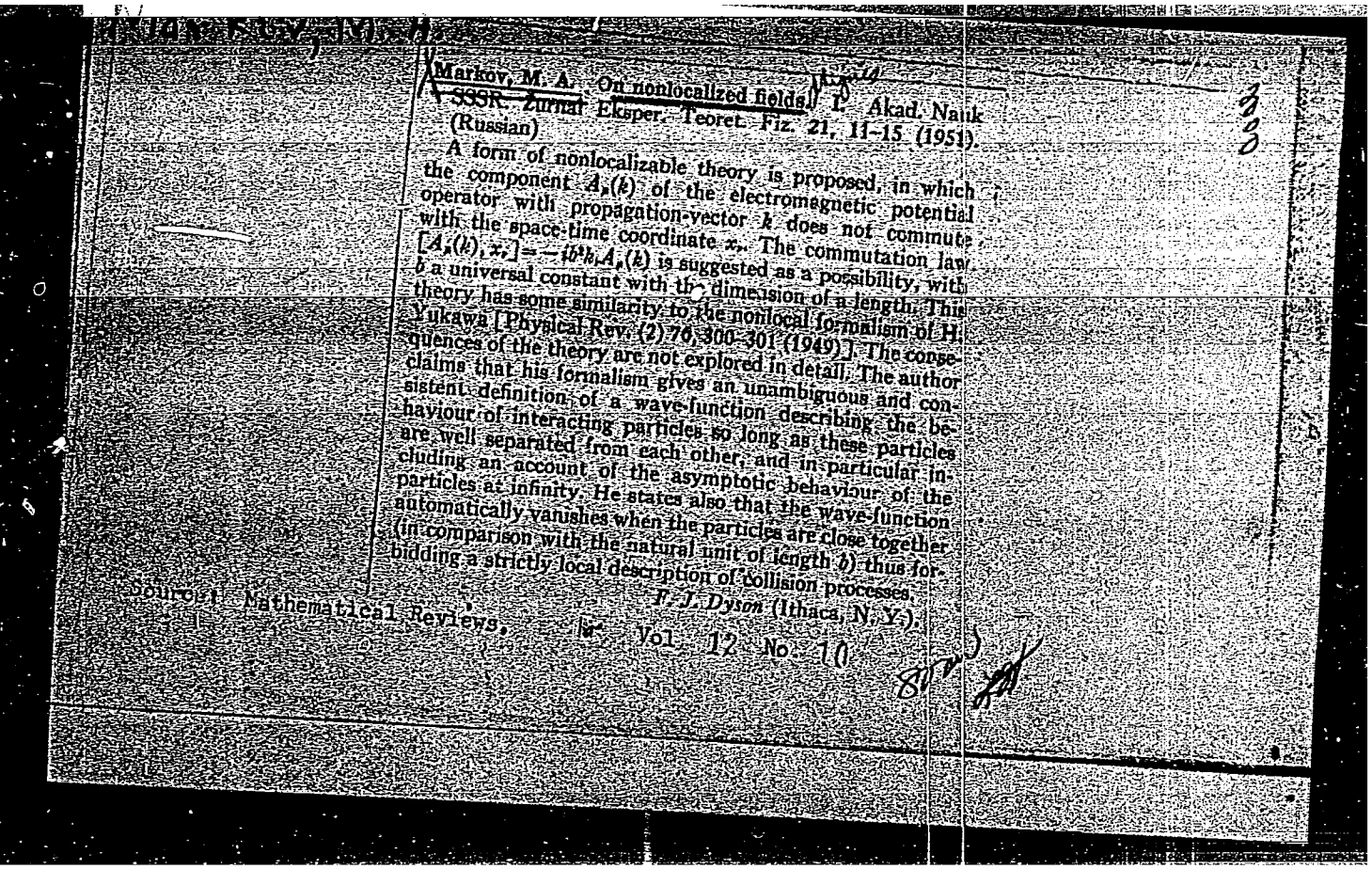
The creation of neutral, scalar, and pseudoscalar mesons by capture of fast neutrons by protons, that is, deuterium formation, has been considered for various widths of the potential well and for the case when the potential well equals zero. Plots have been made showing the dependence of cross section on neutron energy.

ASTIA METALLURGICAL LITERATURE CLASSIFICATION

MARKOV, M. A., DRABNIKA, S. I., SUVOROV, S. G. (Editor), AKHLAMOV, S. N.(Tech. Editor), SOKOLOV, A. A. and FEYNBERG, Ye. A.

D. I. Blokhintsev, "Fundamentals of Quantum Mechanics", Osnovy Kvantovoy Mekhaniki, State Press for Technical-Theoretical Literature.

Table of Contents W-17671, 5 Apr 1951



Markov, M. A. On nonlocalized fields. I. Akad. Nauk SSSR. Zurnal Eksper. Teoret. Fiz. 21, 11–15 (1951). (Russian)

A form of nonlocalizable theory is proposed, in which the component $A_\nu(k)$ of the electromagnetic potential operator with propagation-vector k does not commute with the space-time coordinate x_ν. The commutation law $[A_\nu(k), x_\nu] = -ib^2 k_\nu A_\nu(k)$ is suggested as a possibility, with b a universal constant with the dimension of a length. This theory has some similarity to the nonlocal formalism of H. Yukawa [Physical Rev. (2) 76, 300–301 (1949)]. The consequences of the theory are not explored in detail. The author claims that his formalism gives an unambiguous and consistent definition of a wave-function describing the behaviour of interacting particles so long as these particles are well separated from each other, and in particular including an account of the asymptotic behaviour of the particles at infinity. He states also that the wave-function automatically vanishes when the particles are close together (in comparison with the natural unit of length b) thus forbidding a strictly local description of collision processes.

F. J. Dyson (Ithaca, N. Y.).

Source: Mathematical Reviews, Vol. 12 No. 10

MARKOV, M.A.

3000

Markov, M. A. On the differences between particles and antiparticles obeying Dirac's equation. Akad. Nauk SSSR. Zurnal Eksper. Teoret. Fiz. 21, 761–769 (1951) (Russian)

The discussion is organized under the headings 1) Neutral fields: (a) meson fields, (b) neutrino fields; (c) differences between neutrino and antineutrino. 2) Charged fields: (a) meson fields, (b) β-forces. The Dirac equation for a nucleon in interaction with one of the above fields is contrasted with that for the antinucleon. Particular attention is devoted to the sign of the specific charge for the five standard transformation types of interaction, in order to pick out the "Majorana theories", that is, theories "without antiparticles". The following is typical of the type of result obtained by rather obvious considerations: The specific charge for neutral scalar or pseudovector interaction with antinucleons has the same sign as for that with nucleons, whereas it has the opposite sign in the case of pseudoscalar, vector or tensor interaction. *A. J. Coleman* (Toronto, Ont.)

Source: Mathematical Reviews, Vol. 13 No. 4

MARKOV, M. A.

USSR

723. A dynamically deformable form-factor of elementary particles. M. A. MARKOV. *Zh. eksper. teor. Fiz.* 25, No. 3(11) 327-38 (1953) In Russian.

Usually form-factors are assumed to be independent of the forces acting on the particle, which is equivalent to the assumption of a perfectly rigid structure (apart from the kinematic Lorentz contraction). The signal velocity inside such a structure is infinite, in contradiction with the principle of relativity. The usual form-factor theories must, therefore, contain hidden inconsistencies which are responsible for their failure; the nature of these is illustrated in the Tomonaga-Schwinger as well as the *S*-matrix formulations of rigid form-factor theories. The description of a system with a deformable form-factor $F(x)$ leads to the treatment of $F(x)$ as a new field. It is natural to attempt to identify also this field with currently studied fields. From this point of view the Dirac equation for a "free" proton should be regarded as an approximate equation for the motion of the centre of gravity of a distribution of charge, whose form-factor $F(x)$ is the density $\rho(x)$ of e.g. a π-meson field $[\rho(x) = ie(\phi^*\dot{\phi} - \dot{\phi}\phi^*)$ for scalar mesons$]$. The pion field is described by a Klein-Gordon equation which, in turn, contains a form factor $f(x)$ (e.g. $f = \Psi^*\Psi$, where Ψ is the nucleon field). The resulting complicated system of inter-related equations can be approached in a phenomenological way by the use of a simple deformable form-factor. An example is given by taking for K an expression of the type exp (minus the scalar product of the nucleon and meson wave-numbers). The resulting modification of the differential cross-section $\sigma(E, \theta)$ for the scattering of $\pi\pm$ mesons by a proton is given by a simple function of E and θ, which predicts an eventual decrease of σ with E and, for π^+ (but not π^-), a relatively augmented scattering at large angles. Similar considerations lead to simple predictions regarding the modifications in the photo-production of charged and neutral mesons. W. J. SWIATECKI

MARKOV, M. A.

USSR/Nuclear Physics - Particle Theory Nov 53

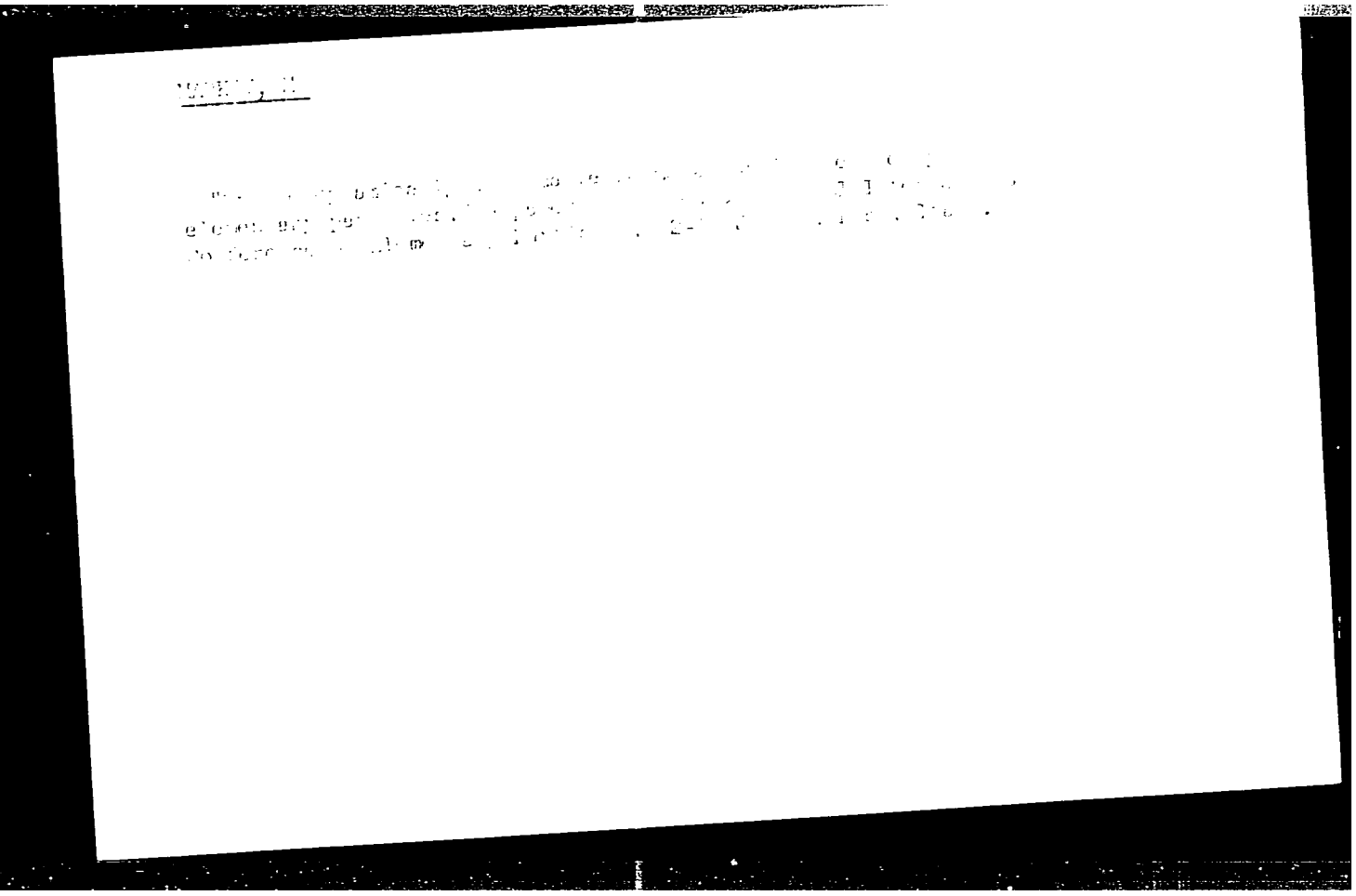
"Nonlocal Fields and the Complex Nature of the 'Elementary' Particles (the Dynamically Deformable Form-Factor)," M. A. Markov

Usp Fiz Nauk, Vol 51, No 3, pp 317-341

Reviews existing attempts, Western and Soviet, to consider the elementary particles as fields (extensions). Discusses the phenomena appearing in the case of the approximate applicability of nondeformable form-factors (the creation of charged mesons by photons, and the

272T53

photo-generation of neutral mesons). Cites 8 Western and 3 Soviet references (D. Blokhintsev, ZhETF 18, 1948; M. Markov, ZhETF, 10, 1940, and 21, 1951).



MARKOV, M. A.

"On the Classification of Fundamental Particles," published by the Academy of Sciences USSR, 1955

English translation available Branch #5 E-3672

Paper presented at Rochester, N.Y. Conference on High Energy Nuclear Physics, 1955

FD-2354

USSR/Nuclear Physics - Hyperions and mesons

Card 1/2 Pub. 146 - 19/34

Author : Markov, M., and Stakhanov, V.

Title : Possible beta-decay of hyperions and k-mesons

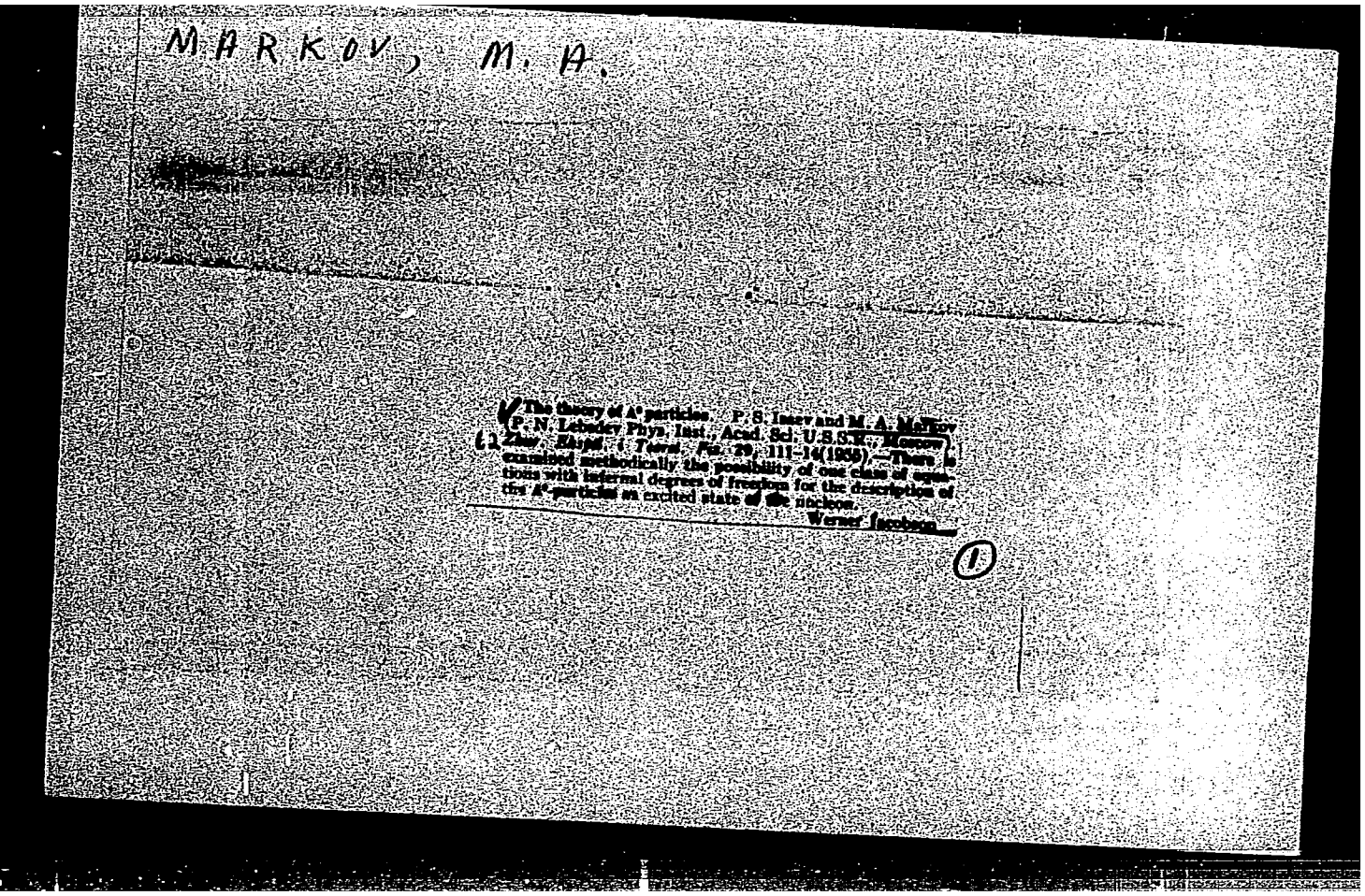
Periodical : Zhur. eksp. i teor. fiz. 28, 740, Jun 1955

Abstract : The writers of the present note consider as an obvious established fact that Λ^0-particles can enter the composition of complex nuclei on par with nucleons. Unknown, however, is how far the kinship of hyperions and nucleons extends (V. Stakhanov, Diploma work, Moscow State University, 1954), in every case there being certain grounds for considering the Λ^0-particle as a nucleon situated in a certain excited state with all the consequences from this notion (V. Stakhanov, ibidem); e. g. such a nucleon could be beta-active: $\Lambda^0 \rightarrow P + e^- + \nu$. The purpose of the present note is to turn attention to the fact that in this case thanks to the high upper bound of the energy of decay one can expect small lifetimes (tau sub-beta) comparable with the observed lifetimes of Λ^0-particles, i. e. sub-pi ($\Lambda^0 \rightarrow \pi^- + P$). The authors note that these ideas can be

applied also to the case of K-mesons (M. A. Markov, Dok. Akad. Nauk SSR, 101, 449, 1955) under certain conditions (zero spin, decay with emission of Fermi particles, etc.). Three references: e. g. W. Fry and M. Swami, Phys. Rev. 96, 1954.

Institution : Physical Institute im. Lebedev, Acad. Sci. USSR

Submitted : Feb 9, 1955



MARKOV, M. A.

The theory of A°-particles. P. S. Isaev and M. A. Markov (P. N. Lebedev Phys. Inst., Acad. Sci. U.S.S.R., Moscow). Zhur. Eksptl. i Teoret. Fiz. 29, 111-14(1955).—There is examined methodically the possibility of one class of equations with tetrad degrees of freedom for the description of the A°-particles as excited state of the nucleon.
Werner Jacobson

(1)

Markov, M.

1-7/1

Markov, M. On the theory of the dynamically deformable elementary particle. Doklady Akad. Nauk SSSR (N.S.) 101, 1551–54 (1955). (Russian)

This is a very general and preliminary discussion of methods of making interactions between elementary particles non-local without introducing rigid structures defined by fixed form-factors. The proposal is to make the "form-factor" itself a dynamical part of the system, reacting to external forces in a causal way. A set of equations partially embodying this idea is presented.

F. J. Dyson (Princeton, N.J.)

MARKOV, M.A.

USSR/Physics

Card 1/1 Pub. 22 - 14/49

Authors : Markov, M.A., Member-Correspondent of the Acad. of Sc., USSR

Title : "Hyperons", i.e., nucleons in an excited state, as a possible cause (mechanism) of mass particle formation

Periodical : Dok. AN SSSR 101/3, 449-452, Mar 21, 1955

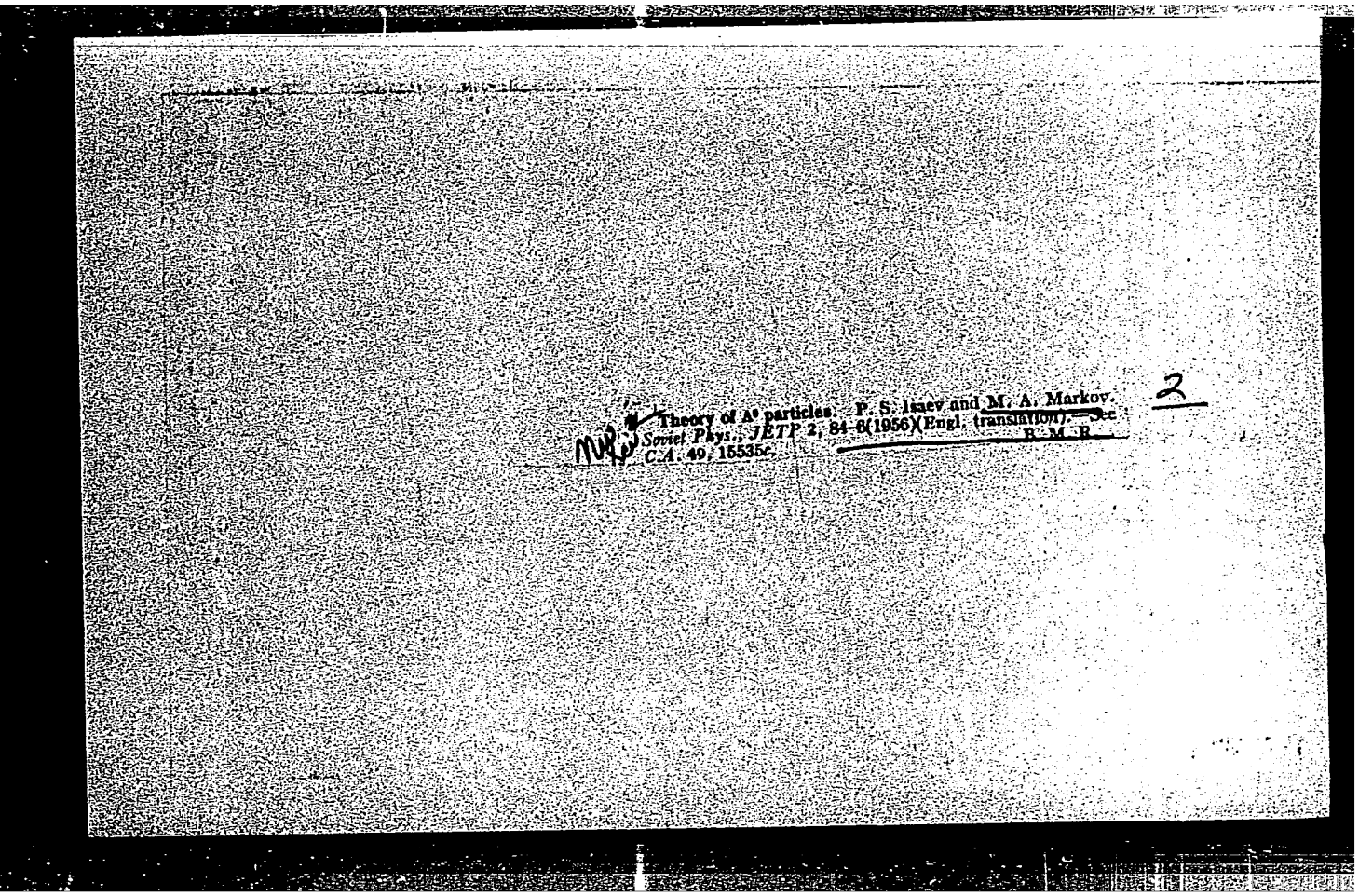
Abstract : An attempt is made to connect (theoretically) the mass formation of particles (nucleons and anti-nucleons) with the disintegration of "hyperons", i.e., nucleons which are excited by -mesons and are in the cascade form of disintegration. A number of peculiarities which may be met in the theories dealing with such subjects are pointed out (a few exemplary cases are discussed). Two references: 1 USSR and 1 USA (1949-1955).

Institution : The Acad. of Sc., USSR, P. N. Lebedev Physical Institute

Submitted : December 21, 1954

MARKOV, M.

Classification of hyperons and heavy mesons. M. Markov. *Soviet Phys. "Doklady"* 1, 107-10 (1956) (English translation).—See *C.A.* 51, 6701. B. M. R.



Theory of A° particles. P. S. Isaev and M. A. Markov. Soviet Phys., JETP 2, 84-6(1956)(Engl. translation). See C.A. 49, 15535c. R. M. R.

2

Markov, M.

USSR/Theoretical Physics - Quantum Field Theory B-6

Abst. Journal : Referat Zhur - Fizika, No 12, 1956, 33815

Author : Markov, M.

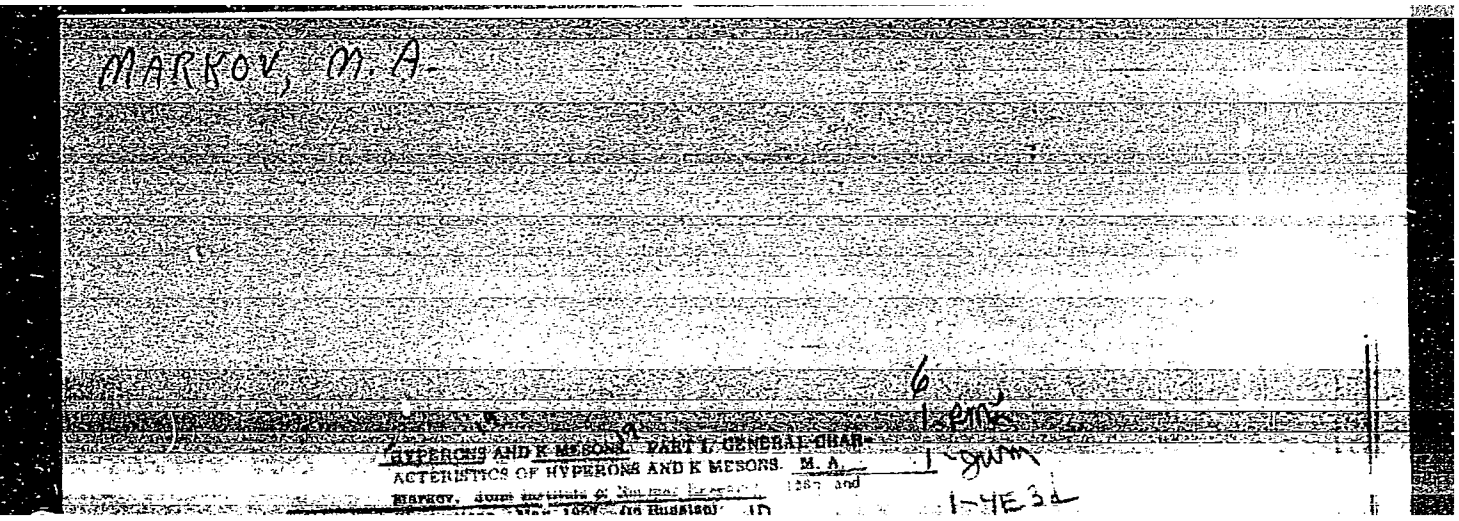
Institution : Physics Institute, Academy of Sciences USSR

Title : Remark Concerning the Systematization of Hyperons in Heavy Mesons

Original Periodical : Dokl. AN SSSR, 1956, 106, No 5, 814-817

Abstract : A systematization of hyperons and K-mesons is proposed. The hyperons are considered as excited states of nucleons, whereby the number of the excitation coincides with the value of the oddity of the given hyperon. Generalizing the Fermi-Yang hypothesis, the author considers K-mesons as bound systems, consisting of a nucleon (antinucleon) and an antihyperon (hyperon). The suggested systematization is compared with the Gell-Mann systematization.

Card 1/1



MARKOV, M. A.

19 19

HYPERONS AND K MESONS. PART II. ISOTOPIC SPIN AND SYSTEMATICS OF FUNDAMENTAL PARTICLES. M. A. Markov. Joint Institute of Nuclear Research. 210p. and illustrations. Mar. 1957. (In Russian)

The isotopic invariants in various types of interactions, the development of isotopic formalism and formal scheme for classical particle classification, four dimensional variance of the isotopic spin, and further development of tri-dimensional variance are discussed, as well as structural concepts in the theory of fundamental particles and M. Goldhaber's scheme (Phys. Rev. 101, 433(1956)). (R.V.J.)

6
1-KM
1-JMM
4E3d

MARKOV, M

AUTHOR: MARKOV,M. 53-2-9/9
TITLE: Comments to D.KONOSENKO'S Work on "Semiconductor Bolometers" (Po povodu stat'i D.Konosenko: Poluprovodnikovye bolometry, Russian)
PERIODICAL: Uspekhi Fiz.Nauk, 1957, Vol 62, Nr 2, pp 197-199 (U.S.S.R.)

ABSTRACT: In his paper KONOSENKO endeavors to systemize the bolometers made of semiconductors and to establish their importance for the measuring of infrared radiation as compared with other bolometers. According to MARKOV this statement contains a number of errors which he mentions and discusses:
KONOSENKO, when judging the sensitivity of bolometers, ignores the particular features of the electric amplifiers connected to the bolometer and therefore his evaluation of them is wrong.
KONOSENKO'S opinion that semiconductor bolometers are better than metal bolometers cannot be shared.
MARKOV proves to KONOSENKO that he did not display enough care when citing published works as references. Furthermore, MARKOV declares several of KONOSENKO'S statements concerning various properties as absolutely wrong. KONOSENKO'S paper appeared in Uspekhi Fizicheskikh Nauk 1955, Vol. 56, Nr 2, p.283.

PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress
Card 1/1

21(8) PHASE I BOOK EXPLOITATION SOV/1413

Markov, Moisey Aleksandrovich

Giperony i K-mezony (Hyperons and K-Mesons) Moscow, Fizmatgiz, 1958.
343 p. (Series: Sovremennyye problemy fiziki) 5,000 copies printed.

Eds.: Alekseyev, D.M. and I.I. Denisov; Tech. Ed.: Akhlamov, S.N.

PURPOSE: This book is intended for theoretical physicists and scientists in the field of nuclear physics and the physics of elementary particles. It may also be used by students of advanced courses and Aspirants specializing in nuclear physics.

COVERAGE: A detailed review is given of experimental and theoretical work on the physics of two cosmic ray particles: hyperons and K-mesons.

TABLE OF CONTENTS

Card 1/6

MARKOV, M. A.

"An Example of a Field Theory with Indefinite Metric in Hilbert Space."

Nuclear Physics, 10, 2, 1959, pp. 140-50 (No. Holland Publ. Co.,)

Joint Inst. of Nuclear Research, Dubna, USSR

A field theory is considered in which the Green's functions have singularities not on a cone but on a hyperboloid, The Metric of the corresponding Hilbert space is indefinite. Equations of motion for the boson and fermion fields are derived. The theory goes over to the usual field theory when a certain constant(characteristic length) approaches zero. The ultimate aim of the investigation is an attempt to find a possible reasonable interpretation of the negative energy density of the boson fields, of the negative probabilities. and of other similar features which appear in the theory, by appropriately modifying the concept of a particle coordinate so as to obtain the proppsed propagation functions.